

Time and the Science of the Soul in  
Early Modern Philosophy

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# Time and the Science of the Soul in Early Modern Philosophy

*By*  
Michael Edwards



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For Kath, Gwen, and Hector



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## INTRODUCTION

In 1687, Isaac Newton outlined his theory of time in a ‘Scholium’ to Part One of the *Philosophiae naturalis principia mathematica*. He argued that ‘the common people’ conceive the quantities of time, space and motion “under no other notions but from the relation that they bear to sensible objects. And thence arise certain prejudices, for the removing of which it will be convenient to distinguish them into absolute and relative, true and apparent, mathematical and common.”<sup>1</sup> Accordingly, he distinguished time into its absolute and relative forms:

Absolute, true, and mathematical time, of itself, and from its own nature flows equally without relation to anything external, and by another name is called duration: relative, apparent, and common time, is some sensible and external (whether accurate or unequal) measure of duration by the means of motion, which is commonly used instead of true time...<sup>2</sup>

Newton’s theory of absolute time distinguished time’s real nature from our imperfect, sensible apprehension or measurement of it, and made it wholly independent of anything ‘external’, such as motion. Another significant feature of Newtonian absolute time, however, was the way in which it treated the connection accepted by many of Newton’s philosophical predecessors between time and the soul. Newton’s account in the *Principia* essentially implied a very limited relationship between time and the human soul. He separated the real, ‘absolute’ nature of time from sensible objects and also, by extension, from the act of sensing and from other mental processes. Even in his discussion of what he called ‘relative, apparent, and common time’, he offered a fairly cursory account of how we become aware of time (that is, of how the soul perceives time), and took no account at all of whether time is involved in the operations of the soul itself. In many respects, Newton’s discussion of time denied that either the way in which the human soul perceived or internalized time or the contribution made by the soul to the nature of time itself were problematic or philosophically interesting issues. Although Newton’s account of time was challenged

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<sup>1</sup> Isaac Newton, *The Principia: Mathematical Principles of Natural Philosophy*, translated by I. Bernard Cohen and Anne Whitman (Berkeley: University of California Press, 1999), 408.

<sup>2</sup> Newton, *Principia*, 408.

by many of his contemporaries, including Leibniz, the relatively confined nature of his interest in these questions has influenced most subsequent accounts of the concept of time in the seventeenth century.<sup>3</sup> In a sense, then, the *Principia* took the soul out of time.

Newton's treatment of time has been interrogated from a variety of perspectives.<sup>4</sup> Many modern scholars have also attempted to identify precursors of Newtonian absolute time in the work of a number of authors from the late sixteenth century onwards,<sup>5</sup> such as Bernardino Telesio's *De rerum natura iuxta propria principia* (1570), Francesco Patrizi's *Nova de universis philosophia* (1591), Pierre Gassendi's *Syntagma philosophicum*, Walter Charleton's *Physiologia Epicuro-Gassendo-Charletoniana* (1654), and Isaac Barrow's *Lectiones geometricae* (1670).<sup>6</sup> In different ways, all of these early modern authors advanced the position that time is an immaterial entity that is parallel to space, and which flows independently and absolutely. There has, however, been a strong tendency amongst historians of philosophy and of physics to imply that this model was the only significant development within theories of time in the seventeenth

<sup>3</sup> See Gottfried Wilhelm Leibniz, *The Leibniz-Clarke Correspondence: Together with Extracts from Newton's Principia and Opticks*, ed. H.G. Alexander (Manchester: Manchester University Press, 1956); on the context of the Leibniz-Clarke debates, see Steven Shapin, "Of Gods and Kings: Natural Philosophy and Politics in the Leibniz-Clarke Disputes," *Isis* 72: 2 (1981): 187–215.

<sup>4</sup> See *inter alia* Robert Di Salle, "Newton's Philosophical Analysis of Space and Time," in *The Cambridge Companion to Newton*, ed. I. Bernard Cohen and George E. Smith (Cambridge: Cambridge University Press, 2002), 33–56; Robert Rynasiewicz, "By Their Properties, Causes and Effects: Newton's Scholium on Time, Space, Place and Motion: Part I: The Text," *Studies in History and Philosophy of Science* 26 (1995): 133–153; *Idem.*, "By Their Properties, Causes and Effects: Newton's Scholium on Time, Space, Place and Motion: Part II: The Context," *Studies in History and Philosophy of Science* 26 (1995): 295–321; Howard Stein, "Newtonian Space-Time," in *The Annus Mirabilis of Sir Isaac Newton 1666–1966*, ed. Robert Palter (Cambridge, MA: MIT Press, 1967).

<sup>5</sup> Steffen Ducheyne, "J.B. Van Helmont's *De Tempore* as an Influence on Isaac Newton's Doctrine of Absolute Time," *Archiv für Geschichte der Philosophie* 90: 2 (2008): 216–228; Piero Ariotti, "Toward Absolute Time: The Undermining and Refutation of the Aristotelian Concept of Time in the Sixteenth and Seventeenth Centuries," *Annals of Science* 20 (1973): 31–50; *Idem.*, "Toward Absolute Time: Continental Antecedents of the Newtonian Conception of Absolute Time," *Studi internazionale di filosofia* 5 (1973): 141–168.

<sup>6</sup> Sarah Hutton, "Some Renaissance Critiques of Aristotle's Theory of Time," *Annals of Science* 34 (1977): 354–363; Bernard Rochot, "Sur les notions de temps et d'espace chez quelques auteurs du XVII<sup>e</sup> siècle, notamment Gassendi et Barrow," *Revue d'histoire des sciences* 9 (1956): 97–104; Karl Schuhmann, "Zur Entstehung des neuzeitlichen Zeitbegriffs: Telesio, Patrizi, Gassendi," in *Karl Schuhmann. Selected Papers on Renaissance Philosophy and on Thomas Hobbes*, ed. Piet Steenbakkers and Cees Leijenhorst (Dordrecht: Springer, 2004), 73–98. On Newton and Barrow, see Mordechai Feingold, "Newton, Leibniz, and Barrow Too: An Attempt at a Reinterpretation," *Isis* 84: 2 (1993): 310–338.

century.<sup>7</sup> In contrast to this approach, I argue that viewing early modern theories of time solely through a Newtonian lens can distort our perspective strikingly: in fact, attending to the intellectual history of time before Newton reveals a philosophical approach that cannot always be assimilated coherently to grand narratives about the development of absolute time.

The contrast between theories of ‘absolute time’ and what went before is often quite stark. Around seventy-five years before Newton published the *Principia*, Bartholomaeus Keckermann (1571–1609) could confidently state in his *Systema physicum* that considering the relationship between time and the soul “produces the most complex questions of all on this subject.”<sup>8</sup> Keckermann was one of many Aristotelian philosophers, scholastics, or ‘philosophers of the schools’, who approached the soul as the animating principle of all living organisms—that is, as the principle that explained powers such as growth, reproduction and sense-perception, as well as emotion and reasoning. In this instance, Keckermann wrote as a commentator on Book IV of Aristotle’s *Physics*, and he was thinking particularly of the passage at *Physics* 223a21–a29 which states enigmatically that “it is impossible for there to be time unless there is soul, but only that of which time is an attribute, i.e. if *movement* can exist without soul.”<sup>9</sup> This terse and puzzling text, which still provokes scholarly debate,<sup>10</sup> was commonly read by Hellenistic, medieval and early modern commentators as an argument that time in some way depends on, or is constructed by, the soul. It was an argument that gave the soul a central role in discussions of time, but it also represented a broader philosophical perspective that was not only circumvented by Newton,<sup>11</sup> but which has also been neglected by many more recent historians of early modern philosophy.

<sup>7</sup> See e.g. John Earman, *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time* (Cambridge MA: MIT Press, 1989), 6–20.

<sup>8</sup> Bartholomaeus Keckermann, *Opera omnium quae extant tomus primus* (Geneva: Apud Petrum Aubertum, 1614), col. 1379: “Necque vero omittemus istam adhuc difficultatem, quae est in textu Aristotelis, & quae intricatissimas omnium circa hanc materiam quæstiones genuit, cum nempe Philosophus text. 131 dicit, *quia nihil aptum est numerare quam anima rationalis: idcirco impossibile est tempus esse, si non sit anima...*”

<sup>9</sup> Aristotle, *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. Jonathan Barnes (2 vols. Princeton: Princeton University Press, 1984), II, 377.

<sup>10</sup> See e.g. Ursula Coope, *Time for Aristotle: Physics IV.11–14* (Oxford: Oxford University Press, 2005); Julia Annas, “Aristotle, Number and Time,” *Philosophical Quarterly* 25 (1975): 97–113.

<sup>11</sup> For Newton’s early engagement with Aristotelian philosophy, see J.E. McGuire and Martin Tamny, *Certain Philosophical Questions: Newton’s Trinity Notebook* (Cambridge: Cambridge University Press, 2002).

*Physics* IV contained the best-known statement of this perspective, but connections between time and the soul were also evident elsewhere in the Aristotelian corpus, and particularly in *De anima*, Aristotle's work on the soul, which served as the foundation for what early modern Aristotelians typically called the 'science of the soul' (*scientia de anima*). Discussions of these issues within early modern Aristotelianism occurred both in formal commentaries on the *Physics* and *De anima* and in textbooks of natural philosophy and metaphysics. Although the boundaries between these genres were often elastic and permeable, some important distinctions existed.<sup>12</sup> Commentaries were usually more expansive, technically sophisticated works that drew on a range of classical and medieval authorities, presenting both a detailed exegesis of Aristotle's text and treatments of the philosophical issues that stemmed from it. Although popular existing texts were still reprinted and reissued, the pace of publication had slowed considerably by the early seventeenth century; relatively few new commentaries on either the *Physics* or *De anima* were published after about 1610. Natural philosophy textbooks such as those of Keckermann, on the other hand, were more general works with varying levels of sophistication, intended primarily for university students, which became more widespread from the early seventeenth century onwards.<sup>13</sup>

Within the intellectual context of Aristotelianism and scholasticism, it was quite natural for Keckermann and many of his contemporaries to assume that thinking about how time and the soul were related was a difficult but nevertheless worthwhile exercise. His comments formed part of a wider tendency to characterize time itself as a significant but spiny philosophical problem. Writing in 1644, the German author Anton Deusing (1612–1666) summed up the common opinion when he argued that time's very nature was obscure. Retailing a story told by many other late scholastic authors, Deusing noted that the ancient Egyptians had rightly depicted this 'occult nature' through the image of a serpent whose tail was hidden by its head: in revealing the head, the image showed that time was real and not mere imagination, but obscuring the tail indicated the 'secret essence' of time which, since it is hard to perceive, is by no means easy

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<sup>12</sup> See Michael Edwards, "The Fate of Commentary in the Philosophy of the Schools, c.1550–1640," *Intellectual History Review* 22 (2012): 519–536.

<sup>13</sup> On the textbook tradition, see Charles B. Schmitt, "The Rise of the Philosophical Textbook," in *The Cambridge History of Renaissance Philosophy*, ed. Charles B. Schmitt, Quentin Skinner, Eckhart Kessler and Jill Kraye (Cambridge: Cambridge University Press, 1988), 792–804, and Patricia Reif, "The Textbook Tradition in Natural Philosophy, 1600–1650," *Journal of the History of Ideas* 30 (1969): 17–32.

to explain.<sup>14</sup> Such assumptions about time's abstruse nature had a long history. Deusing, for example, noted that Aristotle himself had recognised the 'obscure' nature of time.<sup>15</sup> But the best-known source for these discussions was undoubtedly Book 11 of Augustine's *Confessions*. "What is time?" Augustine wondered, "If no-one asks me, I know; if I wish to explain to an enquirer, I know not."<sup>16</sup> Early modern scholastic authors consciously echoed Augustine on this point, and in citing him they acknowledged that uncertainty was a traditional and perhaps necessary part of discussing time.<sup>17</sup> But this uncertainty was counterbalanced by an appreciation of the significance and fertility of the connections between time and the soul. A great many authors writing in the peripatetic, Aristotelian tradition of the late renaissance believed that the soul could be connected to time in stimulating and philosophically important ways.

Largely because of their assumptions about the importance of the tradition that culminated in Newton, some scholars have represented the Aristotelian approach to the concept of time as homogeneous and relatively unsophisticated. In the past, this approach has often been connected to

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<sup>14</sup> Anton Deusing, *Naturae theatrum universale* (Harderwijk: apud Nicholaum a Wieringen, 1644), 389–90: "Hanc occultam temporis naturam Ægyptii Philosophi depicta imagine serpentis, caudam capite occultantis, ingeniose adumbrarunt. Capite enim detecto, temporis non fictam, sed realem existentiam, quae animis se ingerit humanis, significare voluerunt; delitescente vero cauda abstrusam temporis essentiam: quae ut perceptu est difficilis, ita explicatu facilis haudquaquam est."

<sup>15</sup> Deusing, *Naturae theatrum universale*, 389: "Temporis naturam atque aequem cognitum obscuram esse ait Arist. 4. phys. t. 93 atque ipsa loci est difficilis investigatio."

<sup>16</sup> On time in Augustine, see *inter alia* G.J.P. O'Daly, "Augustine on the Measurement of Time: Some Comparisons with Aristotelian and Stoic Texts," in *Neoplatonism and Early Christian Thought: Essays in Honour of A.H. Armstrong*, ed. H.J. Blumenthal and R.A. Markus (London: Variorum, 1981), 171–179; Roland J. Teske, *Paradoxes of Time in Saint Augustine* (Milwaukee: Marquette University Press, 1996); D. C. Ross, "Time, the Heaven of Heavens, and Memory in Augustine's *Confessions*," *Augustinian Studies* 22 (1991): 191–205; Kurt Flasch, *Was ist Zeit?: Augustinus von Hippo, das XI. Buch der Confessiones: historisch-philosophische Studie: Text, Übersetzung, Kommentar* (Frankfurt am Main: Klostermann, 1993); Maria Bettetini, "Measuring in Accordance with *dimensiones certae*: Augustine of Hippo and the Question of Time," in Pasquale Porro, ed., *The Medieval Concept of Time: Studies on the Scholastic Debate and its Reception in Early Modern Philosophy* (Leiden: Brill, 2001), 33–53; Udo Jeck, *Aristoteles contra Augustinum: zur Frage nach dem Verhältnis von Zeit und Seele bei den antiken Aristoteleskommentatoren, im arabischen Aristotelismus und im 13. Jahrhundert* (Amsterdam: B.R. Grüner, 1994).

<sup>17</sup> See e.g. Raffaele Aversa, *Philosophia, metaphysicam physicamque complectens quaestioneibus contexta, in duos tomos distributa. Tomus primus* (Bononiae, 1650), 1052: "Tempus, quam familiare est in loquendo, tam obscurum in cognoscendo, ut notavit D. August. lib 11 Confess. cap. 14. *Quis facile breviterque quid sit tempus explicaverit, vel ad explicandum cogitatione compraehenderit? Quid autem familiarius & notius in loquendo commemoramus quam tempus?*"

the thesis that time and space took a comparatively minor role within Aristotelian natural philosophy, and that one of the many important moves made by Newton was to make them a fundamental part of his physical system: his re-evaluation of the role of time therefore became part of a larger narrative of scientific revolution in the seventeenth century.<sup>18</sup> Even scholars of late Aristotelianism have tended to focus more closely on the concept of space than on time,<sup>19</sup> although concepts of time in medieval philosophy have received more sustained attention.<sup>20</sup> There have been some important exceptions to this trend, but the Aristotelian tradition, in which the connection between time and the soul was generally acknowledged to be an important issue, has often received an unsympathetic hearing. Using Newton's own terminology, the concept of absolute time has typically been contrasted with an undifferentiated model of time as 'relative' or as dependent on motion and the soul.<sup>21</sup> Some scholars have also tried to assimilate early modern debates into later concerns, derived in part from the philosophy of Kant, about the real or ideal nature of time. I pursue a different track, since I believe that such approaches fail to address the nature and diversity of the arguments that early modern Aristotelian authors (and their readers and critics) advanced about the relationship between time and the soul.

This book emphasizes the fertility and complexity of the connections between time and the soul across the philosophical map of late Aristotelianism, and in particular the extent to which treatments of this question within the *De anima* commentary tradition (or what, in Chapter Two, I call the late Aristotelian 'psychology of time') interacted with discussions of the nature of time grounded in Aristotle's *Physics*. As I will show, many Aristotelian authors in this period presented a complex and sophisticated

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<sup>18</sup> Edwin Burtt, *The Metaphysical Foundations of Modern Physical Science: A Historical and Critical Essay* (London: Routledge and Kegan Paul, 1932), 20.

<sup>19</sup> See e.g. Dennis Des Chene, *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought* (Ithaca: Cornell University Press, 1996), 354–377; Cees Leijenhorst, "Jesuit Concepts of *Spatum imaginarium* and Thomas Hobbes's Doctrine of Space," *Early Science and Medicine* 1:3 (1996): 355–380.

<sup>20</sup> The literature on time and duration in medieval philosophy is extensive, and summarizing it briefly is impossible: for various overviews, see *inter alia* the essays in Porro, *Medieval Concept of Time*; Cecilia Trifogli, "Change, Time and Place," in *The Cambridge History of Medieval Philosophy* ed. Robert Pasnau (Cambridge: Cambridge University Press, 2009); also *Idem.*, *Oxford Physics in the Thirteenth Century (ca. 1250–1270): Motion, Infinity, Place and Time* (Leiden: Brill, 2000).

<sup>21</sup> Wolfgang Von Leyden, *Seventeenth-Century Metaphysics: An Examination of Some Main Concepts and Theories* (London: Duckworth, 1968), 271–293.

theory of what the soul contributed to time, how it related to temporal objects, and of how its various functions, including understanding, cognition and sensation, operated in time. Discussions of the connections between time and the soul therefore did not focus exclusively on the dependent or relative nature of time, but also on how the soul (and the human soul in particular) might engage with time.

A limited understanding of the nature of early modern debates has sometimes led scholars to consider discussions of time in this period as an episode in the growth of the discipline of physics (which, *a priori*, they conceive of as a subject on which theories of the soul had little influence), a move that has limited the possibilities of understanding the web of connections made by earlier authors between time and the soul. But to most late Aristotelian authors, time formed part of natural philosophy (known in Latin as *philosophia naturalis*, *physica* or *physiologia*)—a discipline that could also lay claim to discuss the soul.<sup>22</sup> Newtonian absolute time may well have emerged as the dominant concept at the end of the seventeenth century, but our understanding of the character and importance of what it replaced—a complex Aristotelian debate—is inadequate and limited in many respects, often as a result of overly narrow assumptions about where to situate time as an object of inquiry.

In opposition to these trends, I attempt to demonstrate the significance of the late Aristotelian approach to the relationship between time and the soul. *Time and the Science of the Soul* therefore aims to revise current interpretations in several ways. First, it presents the case for taking discussions of time seriously across a range of disciplines in the late Aristotelian tradition: its key claim in this regard is that discussions of time within the early modern *De anima* commentary tradition represent a creative and significant discourse that has hitherto been largely ignored, and which can be read profitably alongside discussions of time in the *Physics* commentary tradition. The connections between time in these two philosophical discourses were fertile and important. However, a connected, comparative approach to the problem of time within the distinct commentary traditions has never been pursued by scholars of early modern Aristotelianism. Second, the book argues for the value of considering late Aristotelian and scholastic perspectives on time alongside the ‘new philosophy’ advanced

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<sup>22</sup> For an overview, see Ann Blair, “Natural Philosophy,” in *The Cambridge History of Early Modern Science Volume III: Early Modern Science*, ed. Lorraine Daston and Katharine Park (Cambridge: Cambridge University Press, 2006), 365–406.

by *novatores* (or ‘new philosophers’) such as Thomas Hobbes and René Descartes. Both Hobbes and Descartes criticized, adapted and attempted to transcend the late Aristotelian science of the soul, and arguments about time and the soul were part of this creative and rancorous dynamic. As such, this book can be situated within a revisionist tendency in the history of early modern philosophy, beginning in the early twentieth century with Etienne Gilson and evident in the more recent work of scholars such as Charles Schmitt, Dennis Des Chene, Roger Ariew and Cees Leijenhorst.<sup>23</sup> Whereas traditional histories of science tended to condemn late-renaissance Aristotelianism outright, more recent literature has attempted to take seriously the complexity, diversity and influence of the Aristotelian tradition that thrived simultaneously with the ‘new science’ of Descartes, Hobbes and Newton, and which influenced it in many respects.<sup>24</sup> Increasingly, scholars have come to recognize the significance of late Aristotelian philosophy as a fertile context for later developments.

*Time and the Science of the Soul* is very definitely a history of arguments about time and the soul, rather than about time and the mind. For most authors in the late Aristotelian philosophical traditions foregrounded in this book, the mind denoted the rational—and therefore uniquely human—powers of the soul and in particular the intellect and the will. The Aristotelian soul, on the other hand, also encompassed powers that humans shared with non-rational animals and plants.<sup>25</sup> Talking about time’s relationship to the mind in this period is therefore an unnecessarily limited approach, since it diverts attention away from the assumptions made by many late Aristotelian authors about the role played the concept of time in the wide range of functions performed by the soul, considered as the animating principle of the body. J.J.A. Mooij’s book on this topic,

<sup>23</sup> Etienne Gilson, *Index scholastico—cartésien* (2nd edition Paris: Vrin, 1979); Charles B. Schmitt, *Aristotle and the Renaissance* (Cambridge: Harvard University Press, 1983); Charles B. Schmitt, *John Case and Aristotelianism in Renaissance England* (Kingston: McGill-Queen’s University Press, 1983); Des Chene, *Physiologia*; Dennis Des Chene, *Life’s Form: Late Aristotelian Conceptions of the Soul* (Ithaca: Cornell University Press, 2000); Dennis Des Chene, *Spirits and Clocks: Machine and Organism in Descartes* (Ithaca: Cornell University Press, 2001); Roger Ariew, *Descartes and the Last Scholastics* (Ithaca: Cornell University Press, 1999); Cees Leijenhorst, *The Mechanisation of Aristotelianism: The Late Aristotelian Setting of Thomas Hobbes’ Natural Philosophy* (Leiden: Brill, 2002).

<sup>24</sup> See Michael Edwards, “Aristotelianism, Descartes, and Hobbes,” *Historical Journal* 50: 2 (2007): 449–464.

<sup>25</sup> For this issue in the medieval tradition, and its implications for early modern philosophy, see Robert Pasnau, “The Mind-Soul Problem,” in *Mind, Cognition and Representation: The Tradition of Commentaries on Aristotle’s De anima*, ed. Paul J.J.M. Bakker and J.M.M.H. Thijssen (Aldershot: Ashgate, 2007), 3–19.

which has relatively little to say about early modern debates, adopts such an approach.<sup>26</sup> As I will argue, the intellectual history of time and the soul in the seventeenth century is in fact a much broader project than a history of 'time and mind'.

This book therefore begins by examining the treatment of time in early modern commentaries on the *Physics*, considering the variety of responses to this text produced by late sixteenth- and early seventeenth-century authors in the late scholastic tradition and situating them within the web of connections established between time and the soul in the disciplines of natural philosophy, metaphysics and psychology. A great number of Aristotelian commentaries and textbooks survive from this period,<sup>27</sup> making a truly comprehensive survey impossible. For the purpose of this study, I therefore consider a broad selection of late Aristotelian metaphysical and natural philosophical texts—both well-known and less commonly discussed—composed before 1650 that includes commentaries and textbooks from France, Italy, northern and central Europe.

These works primarily offered accounts of the ontology of time. The few modern scholars who have considered these commentaries have generally emphasized the arguments of a small number of Jesuit authors, who conceived of time in a limited way as a peculiar species of being that is partly real and partly mental. I show that late Aristotelian responses to this question were far more diverse and philosophically interesting than this somewhat untypical sample indicates, and that eclectic, often sophisticated, answers to the question of how time relates to the soul were advanced in textbooks of natural philosophy from across the confessional divide in the early seventeenth century. Influenced by the theology of the medieval philosopher Duns Scotus (1265/6–1308) and the metaphysics of the sixteenth-century Spanish theologian Francisco Suárez (1548–1617), they presented an account of time's relationship to the soul that contradicted the competing model, derived principally from Thomas Aquinas (1225–1274), by suggesting that the imagination may play a role in the construction and perception of time, and that a particular, 'internal' time may exist as a property of individual beings.

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<sup>26</sup> J.J.A. Mooij, *Time and Mind: The History of a Philosophical Problem* (Leiden: Brill, 2005).

<sup>27</sup> On what Charles Lohr calls this 'prodigious activity', see Charles H. Lohr, "Renaissance Latin Aristotle Commentaries: Authors A–B," *Studies in the Renaissance* 21 (1974): 228–289, at 228–9; Charles Schmitt estimated that between three and four thousand Aristotelian texts were published before c.1600: Schmitt, *Aristotle and the Renaissance*, 14.

The second chapter examines the role of time in late Aristotelian psychology. It considers, for the first time, the role of time and temporality in early modern commentaries on Aristotle's *De Anima*. The *De Anima* commentary tradition was a rich and philosophically varied literature that discussed the nature and functions of the soul as the animating principle of living bodies; it tackled questions of life, growth, emotion, cognition and thought in plants, in animals and in man. However, *De Anima* commentaries from the early modern period have received relatively little scholarly attention, and the role of time within the entire tradition has never been considered. This section examines how a diverse range of late Aristotelian authors used the concepts of time and duration to explain how memory, cognition, and emotion operate in time; how different aspects of the soul might be conceived of as temporal or atemporal (that is, as powers that operate in, or engage with, time); how temporal sequence in the soul relates to the perception of time in the external world; and how the notion of a 'sense of time' formed a peculiar, constitutive part of the human rational soul. It shows how assumptions about time and duration drawn from early modern Aristotelian metaphysics and natural philosophy related (sometimes uneasily) to theories of how the bodies and souls of humans and animals operated in time, in a complex and unjustly-neglected temporal psychology. These authors considered not only how we think of time (that is, how we generate a mental representation or concept of it), but also how we think *in* time—that is, how sense-perception, memory, cognition and other operations of the soul occur as temporal activities, and what the implications of this temporality might be. The *De anima* tradition of the late renaissance presented man not only as a rational, but also a temporal, animal, the analysis of whose powers and capacities depended to a large extent on concepts of time: in this sense, time was a significant part of the late Aristotelian science of the soul.

The second part of the book explores the potential relationship between the arguments discussed in the first two chapters and two of the best-known philosophical figures of the seventeenth century, Thomas Hobbes and René Descartes. Its aim is not to demonstrate the absolute dependence of one tradition on another, but to put aspects of the philosophy of these two *novatores* (or 'new philosophers') into dialogue with its late Aristotelian context in a productive manner. Chapters Three and Four explore the extent to which both Hobbes and Descartes engaged with ideas about the complex relationship between time and the soul in their substantive works and in debates with their critics—Descartes

more cautiously, and Hobbes in a fundamental way. The third chapter discusses Descartes, and attempts to read his discussions of time and duration in the *Meditations*, in his subsequent debates with Pierre Gassendi (1592–1655), in the *Principia philosophiae* and in *Les passions de l'âme* alongside arguments about the ontology and psychology of time from the late Aristotelian tradition. Scholars have traditionally believed that the theme of time played a relatively restricted role in Descartes' philosophy, and have concentrated almost exclusively on explaining his statements about time and continuous creation in the *Third Meditation*, which they have typically interpreted as containing arguments about the continuous or discontinuous nature of time. I suggest that the discussion of time in Descartes' debates with Gassendi offers a significant but neglected perspective on this issue. Gassendi was an astute contemporary critic who believed that Descartes' position in the *Meditations* reflected specific elements of the Aristotelian discourse discussed in Chapter One, and who also formulated his own theory of time in opposition to the arguments that he found in Descartes and the Aristotelian tradition. On the whole, Descartes was more exercised by questions about the ontology of time than about its psychology, an approach that was motivated in part by his commitment to a wholesale reformulation of the late Aristotelian science of the soul. This point was echoed in his discussion of the connections between time and the passions of the soul in his last work, *Les passions de l'âme* (1649).

The final chapter examines the role of time and the soul in the natural and political philosophy of Thomas Hobbes. It relates the discussions of time in his critique of the Catholic author Thomas White's *De mundo dialogi tres* (1642–3), in drafts of his natural philosophy from the 1640s, and in his 1655 work on natural philosophy, *De corpore*, to the rich Aristotelian context sketched out in the first two chapters, and goes on to argue that scholars have underestimated the role of time in Hobbes' thought as a whole. Whilst the few historians who have considered time in Hobbes' thought have emphasized his concerns over the potentially subversive effects of Christian eschatology, I argue that it in fact played a more significant role in his natural philosophy. This section reconstructs the theory of time and the soul developed in Hobbes' natural philosophy, and demonstrates how his concern with the nature of time and its psychology influenced the political theory of his best-known work, *Leviathan* (1651). It suggests that, in a comparable way to many of the late Aristotelian authors discussed in Chapters One and Two, Hobbes thought of man

as a peculiarly temporal animal and that aspects of his theory of the state can be seen as an attempt to address the effects of man's problematic temporal nature.

My argument therefore begins with time in late Aristotelian metaphysics and natural philosophy, and ends with Hobbes' temporal politics. At its heart, however, is the complex and productive cluster of connections between time and psychology, the 'science of the soul', in late Aristotelian philosophy before the mid-seventeenth century. One of the central contentions of *Time and the Science of the Soul* is that early modern Aristotelian philosophers, and the *novatores* who read and rejected their philosophy, were far more familiar with these connections than we are. Although much of the ground that I cover is as yet unrecognised terrain, I also aim to chart the contours of more familiar regions in a new way.

PART ONE

ARISTOTELIAN AND LATE SCHOLASTIC THEORIES  
OF TIME AND THE SOUL



## CHAPTER ONE

### METAPHYSICS AND NATURAL PHILOSOPHY

#### *Introduction*

As with so many topics, most philosophical discussions of the question of time in the late sixteenth and early seventeenth century began with Aristotelian presuppositions. The Jesuit commentator Antonio Rubio (1548–1615) described the situation starkly: according to him, amongst the ancient philosophers, only Aristotle offered a coherent definition of the essential nature of time.<sup>1</sup> As Daniel Sennert (1572–1637) put it in his early seventeenth-century natural philosophy textbook, in order to discover the nature of time, we ought to “progress with Aristotle.”<sup>2</sup> In many cases, however, the ‘progression’ described by Sennert took early modern readers some distance from Aristotle’s own texts. In Book IV of the *Physics*, Aristotle had defined time as “number of movement in respect of the before and after.”<sup>3</sup> Time, he argued, is closely related to change and motion (and particularly the motion of the heavens or *primum mobile*), but it is also distinct from both of these things. Instead, it is a kind of mental representation of motion, or an operation performed by the soul, and specifically by the intellect. This suggestive link between time and the mind or soul provoked much debate amongst later commentators, and made the relationship between time and the soul a central issue for most later Aristotelian authors.

The version of Aristotle’s theory of time available to learned readers in the late sixteenth and early seventeenth centuries was shaped in distinctive ways by its intellectual context, and by the long history of its previous transmission and reception. Like most of the Aristotelian philosophical corpus, by the late sixteenth century Aristotle’s discussion of time had descended through the Arabic, Hellenistic and medieval Latin commentary traditions, and had also been reconciled with Christian theology and

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<sup>1</sup> Antonio Rubio, *Commentarii in Aristotelis de physico auditu seu auscultatione: una cum dubiis & quaestionibus hac tempestate agitari solitis* (Coloniae Agrippinae, 1629), 296.

<sup>2</sup> Daniel Sennert, *Epitome naturalis scientiae* (Oxford, 1632), 100: “Ut igitur, quid tempus sit, inveniamus, ita cum Aristotele progrediamur.”

<sup>3</sup> Aristotle, *Complete Works*, II, 373.

Ptolemaic cosmology—a synthesis that was later challenged indirectly by Copernicus. Time in late Aristotelian philosophy was therefore commonly seen as part of a broader tripartite structure of eternity, *aevum*, and time. These three elements—all of which attracted extensive commentary and debate within the medieval and early modern scholastic traditions—were usually portrayed as forms of duration (*duratio*). The English author John Case's late-sixteenth-century philosophy textbook offered typical, if schematic, definitions of these elements that would have been recognised by most early modern scholastics.<sup>4</sup> According to Case,

Time is the measure of things that have a beginning and an end; *Aevum* is the measure of things that have a beginning but that lack an end; Eternity is called the measure of things that have neither beginning nor end.<sup>5</sup>

In this model, time (*tempus*) was the form of duration that related to created, sublunary beings including humans and animals. *Aevum* was the duration of celestial beings, angels and the rational part of the soul, which survived the death and corruption of the human body. According to many early modern and medieval scholastics, its characteristic qualities gave it an intermediate place between the temporal world and the divine.<sup>6</sup> Finally, eternity (*aeternitas*) was the infinite duration of God, and the form of duration whose characteristics provoked some of the most sustained theological and metaphysical debate.

Late Aristotelian discussions of time generally characterized it as dependent on something else: that is, they considered it as it depended on motion and on the soul. Consequently, the theories of time as an absolute and independent entity discussed in the Introduction were absolutely antithetical—and in some respects incomprehensible—to these late renaissance commentators. For sixteenth- and seventeenth-century Aristotelians, the relationship between time and the soul in *Physics* IV was primarily an ontological question, in which time was considered as a species of being. It was also a question that was necessarily situated

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<sup>4</sup> For a more complex rendering of these distinctions, see e.g. Rubio, *Commentarii in Aristotelis de physico auditu*, 390.

<sup>5</sup> John Case, *Ancilla philosophiae, seu epitome in octo libros Physicorum Aristotelis* (Frankfurt, 1600), 74: “Tempus mensura rerum habentium initium & finem, Aevum mensura rerum habentium initium sed parentium fine, Aeternum rerum habentium nec initium nec finem mensura dicitur.”

<sup>6</sup> See, *inter alia*, *Tempus, aevum, aeternitas: la concettualizzazione del tempo nel pensiero tardomedievale*, ed. Guido Alliney and Luciano Cova (Firenze: Olschki, 2000); Pasquale Porro, “Angelic Measures: *Aevum* and Discrete Time,” in *The Medieval Concept of Time*, ed. Porro.

at the intersection of natural philosophy and metaphysics. These authors believed that time related to bodies in motion, which were the subject of natural philosophy, but they also felt that time should be considered as it depends on being itself, a perspective that also made it the subject of metaphysics.<sup>7</sup> Discussions of the nature of time and its relationship to the soul also often occurred in texts on metaphysics, such as the work of the Jesuits Francisco Suárez and Petrus Fonseca and the Calvinist textbook author Clemens Timpler, as well as in *Physics* commentaries. However, whether they conceived of time as the subject of physics or of metaphysics, all these authors thought of it either as a kind of being that related to natural bodies or, increasingly, as an attribute of being itself. This concern with ontological questions produced discussions of time that engaged with the structure and properties of the soul only in glancing, schematic terms. Although these accounts stressed the importance of the intellect for the concept of time, they did not discuss the soul itself in any great detail. In contrast, early modern commentaries on Aristotle's *De Anima* developed a more complex model of time's role within the soul, and of the soul's temporal and atemporal aspects, which I go on to discuss in Chapter Two.

The attention devoted to the relationship between time and the soul by late renaissance commentators on the *Physics* stemmed partly from the ambiguity of Aristotle's text itself, and partly from the particularly challenging philosophical questions that it provoked. All discussions of this question began with the passage at *Physics* IV.14, 223a21–a29, where Aristotle noted,

Whether if soul did not exist time would exist or not, is a question that may fairly be asked; for if there cannot be some one to count there cannot be anything that can be counted either, so that evidently there cannot be number; for number is either what has been, or what can be, counted. But if nothing but soul, or in soul reason, is qualified to count, it is impossible for there to be time unless there is soul, but only that of which time is an attribute, i.e. if *movement* can exist without soul.<sup>8</sup>

This part of *Physics* IV poses exegetical and philosophical difficulties that continue to tax modern commentators. Aristotle argued both that time cannot exist without the soul, and that “that of which time is an attribute”

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<sup>7</sup> Mário Santiago de Carvalho, “The Concept of Time According to the Coimbra Commentaries,” in *The Medieval Concept of Time*, ed. Porro, 358.

<sup>8</sup> Aristotle, *Complete Works*, II, 377.

might exist separately from it. It is important to note that the term ‘soul’ here is ambiguous: in some modern translations the Greek word *psuchē* is rendered either as ‘mind’ or ‘soul’, terms which, as I noted in the Introduction, were not interchangeable in Aristotle’s thought.<sup>9</sup> Late renaissance commentators drew on medieval and early modern Latin translations of the *Physics* and *De anima* that referred both to time’s relationship to *anima*, meaning the soul in general, and to *intellectus*, meaning the rational part of that soul, which was peculiar to humans and equated roughly (but not exactly) to the modern term ‘mind’, or ‘human understanding’.<sup>10</sup> The intellect’s rational character distinguished it from the other powers of the Aristotelian soul, which animals and plants also possessed. Some tension existed between the two usages because, as it will become apparent, to say that time depends on the soul is not necessarily to say that it depends on the intellect—for a relationship between time and the intellect in an Aristotelian sense is inevitably one that foregrounds the human case. The late Aristotelian position has been most commonly understood as an argument about time’s relationship to *intellectus*.

This chapter examines the connections made in the late Aristotelian textbook and commentary tradition between time and the soul from the perspective of ontology. Its argument is that authors in this period developed two distinct but related approaches to this issue. The first approach engaged with time as a kind of being (*ens*), and centred on a metaphysical discourse of ‘real’ and ‘rational’ being (*ens reale* and *ens rationis*).<sup>11</sup> It treated the soul largely in terms of how it contributed to time’s status as a kind of being; consequently, it limited the role played by the mental powers of reason and imagination within discussions of time. However, the textbook tradition in the late sixteenth and early seventeenth century saw another model of time emerge, which has hitherto been ignored in the secondary literature: this was the concept of internal and external time (*tempus internum* or *tempus intrinsecum* and *tempus externum* or *tempus extrinsecum*). Although this approach still considered time in terms of

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<sup>9</sup> On this issue in the renaissance, see Ian Maclean, “Cardano on the Immortality of the Soul,” in *Cardano e la tradizione dei saperi*, ed. Marialuisa Baldi and Guido Canziani (Milan: Francoangeli, 2003), 195.

<sup>10</sup> On the history of these terms, see R.W. Serjeantson, “The Soul,” in *The Oxford Handbook of Early Modern Philosophy*, ed. Desmond Clarke and Catherine Wilson (Oxford: Oxford University Press, 2011), 119–41.

<sup>11</sup> Capturing the sense of these Latin terms in translation is difficult. Throughout, I translate *ens rationis* as ‘rational being’, rather than ‘being of reason’ or another similarly unwieldy formulation.

a distinction between real and rational being, it also emphasized more strongly attempts to describe the way in which individual beings can be said to exist and endure in time. This model discussed time mainly in terms of duration, and not of motion, and attributed a greater role to the power of imagination within its account of the perception of time. This alternative perspective on time's relationship to the soul had significant implications for examinations of time within the early modern *De Anima* commentary tradition. It essentially marked a distinction between relatively narrow thinking about the contribution made by the soul to the real or rational being of time and accounts of duration and the temporal world that accorded a more elaborate role to the soul.

### *Time as Real or Rational Being*

Most late Aristotelian *Physics* commentaries discussed at least three possible models of how time might be said to depend on the soul.<sup>12</sup> Firstly, that time was a wholly mind-dependent, or 'rational', being (*ens rationis*), a position associated particularly with Augustine, and with a number of ancient philosophers.<sup>13</sup> Secondly, that time was a real being (or *ens reale*), which owed no part of its being to the soul. The third position made time a 'mixed' being that was partly real and partly rational. Of these three options, only the last two were widely accepted amongst early modern Aristotelians.

A significant and commonly cited source for the first position was Book 4, Chapter 3 of Albert the Great's *Physics* commentary.<sup>14</sup> Here, Albert associated the opinion that 'time does not exist unless in the soul' with Galen and Augustine. According to Albert, Galen had argued that "if time does not exist unless it is in the heavens through the motion of the heavens, then those who perceive nothing of the motion of the heavens, perceive nothing of time." Consequently, people born incarcerated

<sup>12</sup> These approaches are discussed in Michaeli Zanardi, *Commentaria cum quaestionibus et dubiis in octo libros de Physico Auditu Aristotelis* (Cologne: Apud Antonium Boetzerum, 1622), 143.

<sup>13</sup> Zanardi, *Commentaria... in octo libros de Physico Auditu*, 143; also Collegium Complutense, *Disputationes in octo libros Physicorum Aristotelis* (Paris: Apud Dionysium Thierry, 1636), 442 and Collegium Conimbricense, *Commentariorum Collegii Conimbricensis Societatis Iesu, in octo libros Physicorum Aristotelis Stagiritae, prima pars* (Cologne: Sumpibus Haeredum Lazari Zetneri, 1625), col. 131.

<sup>14</sup> Zanardi, *Commentaria... in octo libros de Physico Auditu*, 143; Conimbricense, *In octo libros Physicorum Aristotelis Stagiritae, prima pars*, col. 131.

underground should be unable to perceive time: however, in Albert's view, Galen insisted that "this is false, because they perceive time through the motion of the soul, therefore time exists in the soul through the motion of the soul."<sup>15</sup> On Albert's account, Galen associated time not with celestial motion, but with mental motion. He argued that even in the absence of all other movement, mental motion can indicate that time is passing, and therefore time depends on the soul. However, although this 'Galenic' account was frequently discussed by early modern commentators, its ultimate provenance is uncertain.

For Augustine, time depends on mental operations, and its nature is uncovered through temporal self-reflection. Chapter 11 of the *Confessions* famously contradicted Aristotle's association of time with heavenly motion, and argued instead that time is measured in the mind.<sup>16</sup> Augustine cited the biblical example of Joshua, who fought whilst the sun stood still but time continued to pass, as evidence that time cannot depend on external motion.<sup>17</sup> Time, he suggested, is the flow of experience that passes through the mind. Time passes as the mind expects the future, apprehends the present and then remembers the past, and so we construct a concept of time through the operation of our mind. An awareness of time therefore requires both self-awareness and self-reflection of the kind that Augustine himself practised in the *Confessions*. This aspect of Augustine's account of time was essentially a more extreme version of the position ascribed to Galen by Albert. Augustine argued not that mental motion may be substituted for celestial motion in order to signify time, but that time is constituted only by mental motion. His account of the ontology of time therefore depended absolutely on the soul. This argument was rejected by many later Aristotelians, who also rejected the underlying assumption that time can only be explained in terms of psychology and perception. Nevertheless, Augustine's theory of time was an important indirect influence on some sixteenth- and seventeenth-century commentators and textbook authors, particularly those of a Scotist persuasion.

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<sup>15</sup> Albertus Magnus, *Opera omnia* (Aschendorff, 1951–99), vol. 29, 264: "Adhuc autem, est obiectio Galieni, quia si tempus non est nisi in caelo per motum caeli, tunc illi qui nihil percipiunt de motu caeli, nihil percipiunt de tempore. Sunt ergo aliqui incarcerati nati sub terra claustris, qui nunquam motum caeli viderunt nec perceperunt; illi ergo nihil perceperunt de tempore, quod falsum est, quia percipiunt tempus per motus animae; ergo tempus est in anima per motus animae."

<sup>16</sup> Augustine, *Confessions*, transl. R. Pine-Coffin (Harmondsworth: Penguin, 1961), 271.

<sup>17</sup> *Ibid.*, 272; the relevant passage is Joshua 10:13.

As early modern scholastics interpreted them, both Galen and Augustine believed that the concept of time is derived from mental, not celestial, motion. This position had been heavily criticised by medieval scholastics; the proposition that “time is not in things themselves, but only in the apprehension of the mind” was one of the 219 articles condemned by Etienne Tempier, Bishop of Paris, in 1277.<sup>18</sup> From the perspective of late renaissance commentators, the two most influential medieval treatments of question were found in Aquinas and Averroës. In his *Physics* commentary, the Arab philosopher Averroës attempted to reconcile the notions of time as a real, external motion and time as a mental construct by suggesting that time is a composite entity, composed of both external motion and the mental construct of ‘number’.<sup>19</sup> Averroës made the anti-Platonic point that number is not a property of real things, and therefore exists only in the mind.<sup>20</sup> Motion is the material or matter of time (or time *materialiter*), and number is its form (or time *formaliter*). Thus whilst motion exists in the world, time would not exist if the mind did not number motion and consequently give it form. Motion, as the material aspect of time, therefore represents potential time, because time actually exists only when the mind (time’s formal aspect) numbers before and after in motion. For Averroës, time therefore has an internal and an external component, but only the former depends on the mind. Although, as Cecilia Trifogli has demonstrated, this position was criticized by thirteenth century commentators such as Roger Bacon and Richard Rufus, who maintained a strictly realist view of time, it nevertheless influenced many later philosophers.<sup>21</sup>

<sup>18</sup> “Quod aevum et tempus nihil sunt in re, sed solum apprehensione” was proposition number 86 of the 219 articles. On the condemnation, see David Piché, *La condamnation parisienne de 1277. Texte latin, traduction et commentaire* (Paris: Vrin, 1999); *Nach der Verurteilung von 1277. Philosophie und Theologie an der Universität von Paris im letzten Viertel des 13. Jahrhunderts. Studien und Texte*, ed. Jan A. Aertsen, Kent Emery Jr. and Andreas Speer (Berlin: Walter de Gruyter, 2001); John F. Wippel, “The Condemnations of 1270 and 1277 at Paris,” *The Journal of Medieval and Renaissance Studies* 7: 2 (1977): 169–201; Edward Grant, “The Effect of the Condemnation of 1277,” in *The Cambridge History of Later Medieval Philosophy*, ed. Norman Kretzmann, Anthony Kenny and Jan Pinborg (Cambridge: Cambridge University Press, 1982), 537–9; Roland Hissette, *Enquête sur les 219 Articles condamnés à Paris le 7 mars 1277* (Louvain: Publications Universitaires, 1977), 152–4.

<sup>19</sup> Averroës, *Aristoteli de Physico Auditu libri octo, cum Averroës Cordubensis variis in eosdem commentariis* (Venice: Apud Junctas, 1562), 187r. On Averroës, see Cecilia Trifogli, “Averroës’ Doctrine of Time and its Reception in the Scholastic Debate,” in *The Medieval Concept of Time*, ed. Porro (Leiden: Brill, 2001), 57–82 and Trifogli, *Oxford Physics*, 219–230.

<sup>20</sup> On this argument in Aristotle, see Annas, “Aristotle, Number and Time.”

<sup>21</sup> Trifogli, *Oxford Physics*, 223–230, also Annaliese Maier, *Metaphysische Hintergründe der spätscholastischen Naturphilosophie* (Rome: Edizioni di Storia e Letteratura, 1955), 65–91.

In some respects, Aquinas advanced a similar position to Averroës. His account of time, which was divided between his *Physics* commentary and the questions concerning God's eternity in the first part of the *Summa Theologiae* (*Summa* 1a. q.10. a.1–6) was influential amongst late renaissance commentators, and was read with particular attention by Jesuit authors. His discussion of *Physics* IV advanced the position that time, like motion, “does not have a perfect existence outside the soul.”<sup>22</sup> Since time, like motion, exists only as an indivisible part that is numbered or apprehended by the soul, without the soul it is an imperfect being (*ens incompletum*). Aquinas therefore gave the soul a role in the construction of time that paralleled Averroës’ position: both authors agreed that without the soul time cannot have an actual, or complete, existence.

Influenced by their medieval predecessors, early modern critics of Galen and Augustine’s position argued that it made time a rational or mind-dependent being (*ens rationis*). A complex terminology had developed in late Aristotelian metaphysics for discussing real, rational and fictional being.<sup>23</sup> Late renaissance Aristotelians generally believed that because a mind-dependent being is unreal or fictitious, it is necessarily an incomplete or lesser being. Francisco Suárez, for example, defined rational being as “that thing that has being only objectively in the intellect, or which is thought of as a being by reason, since it nevertheless does not have being in itself.”<sup>24</sup> Rational beings, he argued, are not true beings, but merely the shadows of beings (*quasi umbrae entium*), and are therefore comprehensible only by analogy with real beings.<sup>25</sup> Real beings are those such as ‘man’, or ‘stone’, whereas the category of rational being includes chimerae, mental images and fictions. The Jesuit Petrus Fonseca (1528–1599), who taught at the Colégio das Artes at Coimbra from 1555 to 1561 and instigated the famous Coimbra commentaries on Aristotle, distinguished in his metaphysics commentary between rational being and what he called

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<sup>22</sup> St. Thomas Aquinas, *Commentary on Aristotle’s Physics*, transl. Richard J. Blackwell, Richard J. Spath and W. Edmund Thirlkel (London: Routledge and Kegan Paul, 1963), 280. See Maier, *Metaphysische Hintergründe*, 69.

<sup>23</sup> Marie-Luce Demonet, “Les êtres de raison, ou les modes d’être de la littérature,” in *Res et Verba in der Renaissance*, ed. Ian Maclean and Eckhart Kessler (Wiesbaden: Harrassowitz in Kommission, 2002), 177–195.

<sup>24</sup> Francisco Suárez, *Metaphysicarum disputationum tomi duo* (Cologne: F. Heluidius, 1614), 503: “Et ideo recte definiri solet, ens rationis esse illud, quod habet esse obiective tantum in intellectu, seu esse id, quod a ratione cogitatur ut ens, cum tamen in se entitatem non habeat.”

<sup>25</sup> *Ibid.*, 503.

‘fictitious being’ (*ens fictum*).<sup>26</sup> Fonseca argued that rational being is that “whose being depends on the operation of the intellect in such a way as nevertheless can be said of real beings: of which kind are the notions of genus, species, and similar things,” whereas fictitious being is that “whose being thus depends on the operation of the intellect in such a way as can be said of no real being, of which kind are the Chimera, the Tragelaphus, and other fictions.”<sup>27</sup> Fonseca therefore distinguished between mental concepts and wholly fictitious things. Other authors, however, blurred this distinction, calling both ‘rational beings’.<sup>28</sup>

Many late Aristotelian authors denied that time is either a product of imagination (*ens fictum*) or a mental concept (*ens rationis*). More broadly, they rejected the underlying assumption made by Galen and Augustine that the ontology of time is explicable in psychological terms, or that time involves self-reflection. Their most compelling reasons for doing so were theological, because, as the Jesuit Benedictus Pererius argued, denying the reality of time effectively denies the existence of God, by whom time was created and in whose power it remains.<sup>29</sup> However, these authors still had to address Aristotle’s argument that the soul plays some role in time. I argue that their responses to this question were more eclectic and varied than might be assumed.

### *Jesuit Concepts of Real and Rational Time*

The comprehensive Jesuit commentaries and natural philosophy textbooks of the late sixteenth and early seventeenth centuries were intended

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<sup>26</sup> On Fonseca, see Carlos Sommervogel, *Bibliothèque de la Compagnie de Jesus*, 10 vols. (Brussels: Schepens, 1890–1909), vol. VI, 499–507; Charles H. Lohr (1988). *Latin Aristotle Commentaries vol. II: Renaissance Authors* (Florence: Olschki, 1988), 150–1. *Cambridge History of Renaissance Philosophy*, 818.

<sup>27</sup> Petrus Fonseca, *Commentariorum... in Metaphysicorum Aristotelis Stagiritae libros tomus secundus* (Cologne: Sumptibus Lazari Zetzneri Bibliopolae, 1615), col. 467: “Ens rationis proprie sumptum, est ens, cuius esse ita pendet ab operatione intellectus, ut nihilominus de entibus realibus dici possit: cuiusmodi sunt notiones generis, speciei, & similia. Ens fictum, quatenus tale est, est ens, cuius esse ita pendet ab operatione intellectus, ut de nullo ente reali dici possit: cuiusmodi sunt Chimera, Tragelaphus, & alia fictitia.”

<sup>28</sup> See, for example, Rodolphus Goclenius, *Lexicon philosophicum, quo tanquam clave philosophiae fores aperiuntur* (Frankfurt: Typis Viduæ Matthiæ Beckeri, Impensis Petri Musculi et Ruperti Pistorij, 1613), 152–3.

<sup>29</sup> Benedictus Pererius, *De communibus omnium rerum naturalium principiis et affectionibus, libri quindecim* (Rome: Impensis V. Tramezini, apud F. Zanettum, & B. Tosium, 1576), 383.

primarily for use in the colleges of the Society of Jesus, and in universities. However, their influence extended across the European continent, and was particularly evident in central and northern Europe in the early seventeenth century. They were broadly Thomist in orientation, but also often eclectic in their sources and conclusions. Treatments of time and the soul within Jesuit *Physics* commentaries did not represent any kind of contemporary orthodoxy, but they were nevertheless important and influential, particularly for the contemporary textbook tradition. Their approaches to this question followed two patterns: those which argued that time is a real being that does not depend on the soul, and those which argued that time is partly real, and partly mental. The former position was adopted by the Spanish Jesuit Franciscus Toletus (1532–1596), who was Professor of Philosophy and Theology at the Collegio Romano in the 1560s, and the latter position by a number of authors who drew on the arguments of Aquinas and Averroës.<sup>30</sup>

Toletus' *Commentaria una cum quaestionibus in octo libros Aristotelis de physica auscultatione* (first published in 1575) denied that time is a rational being, and also rejected the notion that the soul contributes anything to time's being.<sup>31</sup> Rather, he insisted, “we say with Albert the Great and St Thomas ... that time is formally a real being ...”<sup>32</sup> It cannot depend on the mind because time is the number of motion, and motion is a real being that exists prior to reason or the intellect.<sup>33</sup> Therefore, since motion would exist even if the soul were to be destroyed, so too would its number, which is time. However, Toletus drew an important distinction, which he derived from the Greek commentator Simplicius, between the ‘essence’ and the ‘passion’ of time.<sup>34</sup> The essence of time is “some duration of the former and latter parts of motion”, whereas its passion is “some numberability and measurability of the parts.”<sup>35</sup> The essence of time is absolute, and is independent of the intellect. However, its passion is ‘respective’ and

<sup>30</sup> On Toletus, see *Cambridge History of Renaissance Philosophy*, 838; Lohr, *Latin Aristotle Commentaries*, 458–461.

<sup>31</sup> Franciscus Toletus, *Commentaria una cum quaestionibus in octo libros Aristotelis de Physica Auscultatione* (Venice: Apud Iuntas, 1616), 145r.

<sup>32</sup> *Ibid.*, 145v: “Igitur dicamus nos cum Alb & S Th opusc de tempore, cap 1 & in praesenti, quod tempus formaliter est ens reale ...”

<sup>33</sup> *Ibid.*, 145v.

<sup>34</sup> *Ibid.*, 145v. I have translated the Latin term *passio* here as ‘passion’, which preserves Toletus’ meaning, but does not entirely communicate it to modern readers; here it signifies the passive aspect of time, or its ability to be acted upon.

<sup>35</sup> *Ibid.*, 145v: “In cuius declarationem advertendum primo cum Simpl, quae in tempore duo consideramus. Unum quod ipsius est essentia, & hos est duratio quaedam partium

thus relates to the rational soul as it numbers.<sup>36</sup> It relates to the numbering soul in two ways, however, either by the action of that soul, or by its passion, "that is, that measurability and numberability" of time itself.<sup>37</sup> Time for Toletus involved both active and passive potential: "therefore, that active potential being removed, the potential and passion of numberability would also be taken away: and this is that which Aristotle says."<sup>38</sup> Toletus transformed Aristotle's concept of mind-dependence into a dichotomy between active and passive potential. Time's active potential relates to the soul, but does not depend on it, whereas its passive numberability is an attribute of motion itself, but neither active nor passive potential can exist without each other.

Toletus adopted the Thomist argument that, whilst we cannot say that time depends on the human rational soul, it nevertheless relates fundamentally to the divine intellect. Time according to the Aristotelian definition is the number of motion, but its status as a number (or its 'numberability', *numberabilitas*) does not make it a rational being. Toletus argued that "that numberability or measurability does not depend on the created intellect: for this is not the cause of things, but on the first intellect, which is the cause of all things."<sup>39</sup> Time's dependence on the divine intellect of course makes it not rational but real, since nothing that depends on God can properly be deemed unreal. Toletus also presented a second Thomist argument, suggesting that, whilst time considered absolutely is real, the mind may nevertheless be involved in its construction. He argued that "time with respect to its totality, as it is distinguished against its parts by us into days and years, and we conceive of those all at once, does not exist unless through the intellect."<sup>40</sup> The conventional division of time into days and years depends on the soul because time does not exhibit these divisions successively—rather, they are imposed by

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motus prioris, & posterioris. Alterum est quaedam passio, puta numberabilitas quaedam, & mensurabilitas partium."

<sup>36</sup> *Ibid.*, 145v: "Essentia quidem temporis absoluta est, et ablato quovis intellectu maneret: at passio respectiva est, & ad numerantem refertur."

<sup>37</sup> *Ibid.*, 145v.

<sup>38</sup> *Ibid.*, 145v: "Igitur potentia activa ablata, aufertur potentia & passio numberabilitatis, & hoc est, quod dicit Aristoteles..."

<sup>39</sup> *Ibid.*, 145v: "Advertendum secundo cum S Th praesenti textu, quod optime notavit, quod ista numberabilitas, aut mensurabilitas non dependet ab intellectu creato: hic enim non est rerum causa, sed ab intellectu primo, quae omnium est causa."

<sup>40</sup> *Ibid.*, 145v: "Advertendum tertio, quod tempus quantum ad suam totalitatem, ut contra suas partes distinguitur a nobis in dies & annos, & omnes eas simul concipimus, non est nisi per intellectum."

the intellect. The divisions exist because the intellect apprehends time in terms of a day or a year, and only the mind is capable of conceiving these distinct parts as a succession.

However, Toletus insisted that the involvement of the intellect in this way does not make time a rational being, because it "has a real existence that, since it is successive, is not just like that of other permanent existences, so that it has all its parts at once, but through an instant (of time) or through something indivisible of itself."<sup>41</sup> The peculiar nature of time, which is composed of a series of instants or 'nows', requires the mind to construct and perceive its parts all together. However, because it has this peculiar but real form of successive existence, it cannot be a rational being. Those who believe that Aquinas argued that time is a rational being are mistaken, Toletus claimed, because in fact he saw time as a totality, like motion, that can only have its existing parts all at once through the action of the mind.<sup>42</sup> Thus for Toletus the real nature of time did not contradict the contribution of the soul to that nature.

Examples of the second approach to the problem of time and the soul (that is, the argument that time is partly real and partly mental) appeared in the works of Benedictus Pererius (1535–1610), who also taught philosophy and theology at the Collegio Romano, and the Portugese Jesuits of the Collegium Conimbricense.<sup>43</sup> Pererius's treatment of the problem of time and the soul was based on the concept of number. He sought to counter the argument that "if time is a number, but number does not exist without the action of the soul, since to number is the particular function of the rational soul: therefore time exists in the soul, and hence it will be either a fictional thing, or a rational being."<sup>44</sup> According to Pererius, in *Physics* IV Aristotle argued that "that thing seems not to exist, whose part is nothing, but no part of time exists, since the past does not exist but was, and moreover the future does not exist but will be, and moreover the present is

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<sup>41</sup> *Ibid.*, 145v: "... non tamen hoc facit ipsum esse ens rationis: habet enim existentiam realem, quae cum successiva sit non est sicut aliarum existentiarum permanentium, ut habeat omnes partes simul, sed per instans, vel per aliquod indivisibile sui."

<sup>42</sup> *Ibid.*, 145v.

<sup>43</sup> On Pererius, see Sommervogel, *Bibliothèque*, vol. VI, 499–507; *Cambridge History of Renaissance Philosophy*, 830; Lohr, *Latin Aristotle Commentaries*, 313–320.

<sup>44</sup> Pererius, *De communibus omnium rerum*, 386: "Sed dicit quispiam, si tempus est numerus, numerus autem non existit sine actione animae, quoniam numerare proprium munus est animae rationalis; tempus igitur existit in anima: quare vel erit res fictitia vel ens rationis."

nothing other than the indivisible now, which cannot be a part of time.”<sup>45</sup> However, Pererius did not find this a convincing argument for the unreal nature of time. He denied that time is a rational being on the authority of common experience, Scripture, and the principles of natural philosophy.<sup>46</sup> Firstly, he suggested, “All people both sense and speak of time as some [real] thing”; moreover, the divisions of time, such as hours and days, are something that is discovered or found in this real thing.<sup>47</sup> Common experience therefore locates time in the domain of real things, not of rational things, as the Bible confirms. Pererius assumed that because time was created by God, and is in his power, it cannot be either unreal or solely mental. Finally, the idea that time is unreal because its parts are unreal is contrary to reason because, “time is the measure of motion, but motion is a real being, therefore time is also real. For it is not appropriate, that the measure of a real being should be imaginary.”<sup>48</sup> If this were the case, then, “either time is a fictional being, [in which case] in what way is it therefore to be treated as part of knowledge? Or it is a rational being, [so that we may ask] in what way is it therefore to be treated within physics?”<sup>49</sup> Time, Pererius insisted, must be a real being and hence a proper object of knowledge, and more specifically the subject of natural philosophy.

Like Averroës, Pererius distinguished between the ‘material’ and ‘formal’ aspects of time. The material aspect of time is motion, whereas its formal aspect is the ability “to be numbered according to former and latter.”<sup>50</sup> Although Pererius used this distinction, he also went beyond the strict Averroist position by suggesting that a relationship exists between the soul and the material aspect of time, which Averroës had claimed is extramental. Motion, he argued, exists outside the soul but yet depends

<sup>45</sup> *Ibid.*, 382: “Quidam existimant tempus non esse aliquid reale, sed tantum habere esse propter imaginationem & cogitationem animi nostri, ducti illo communi argumento, quod Aristoteles exponit 4 Phys tex 88 & 89 idque sic habet illud non videtur esse, cuius pars nulla est: temporis autem nulla pars existit: praeteritum non est sed fuit, futurum autem non est sed erit, praesens autem non est aliud quam nunc indivisibile, quod non potest esse pars temporis.”

<sup>46</sup> On experience in Aristotelian natural philosophy, see Des Chene, *Life's Form*, 20–23; also Peter Dear, “The Meanings of Experience,” in *The Cambridge History of Science*, vol. III, 106–131.

<sup>47</sup> Pererius, *De communibus omnium rerum*, 382–3: “Omnis enim de tempore, tanquam de re aliqua, & sentiunt, & loquuntur.”

<sup>48</sup> *Ibid.*, 383: “Nam tempus est mensura motus, sed motus est ens reale, ergo etiam tempus. Non enim convenit, ut entis realis sit mensura imaginaria.”

<sup>49</sup> *Ibid.*, 383: “Postremo, aut tempus est ens fictitium; quomodo igitur tractatur in scientia? aut ens rationis, quomodo ergo tractatur in *Physica*? aut ens reale, quod nos volumus.”

<sup>50</sup> *Ibid.*, 386.

upon it in a twofold way: “firstly in the sense of its efficient cause, insofar as all other motions depend on the motion of the heavens, but this motion depends on the Intelligence that is called the soul of the heavens by the Peripatetics,” which is of course God.<sup>51</sup> Moreover, the material aspect of time also depends on the soul “insofar as nothing of that motion actually exists beyond some indivisible.”<sup>52</sup> This is a version of the Thomist argument rehearsed by Toletus: as only the indivisible ‘now’ is real and present, only the action of the mind can unite the parts of time to allow it to be perceived all at once. However, the contribution of the soul to the material aspect of time does not make time a rational being. Pererius drew on the example of motion to illustrate this point: “Therefore since time taken materially is the same thing as motion, in the same way as motion it will depend and not depend on the soul; and just as no-one would say that motion is a rational being, on account of some dependence of it on the soul, thus neither should that be thought or affirmed of time.”<sup>53</sup> He adopted a broader conception of motion than Averroës here, arguing that it resembles time in its mind-dependence.

Number, the formal aspect of time, on the other hand, “necessarily needs the operation of the intellect.”<sup>54</sup> This aspect of time must relate to the soul, Pererius argued, because the motion or duration that constitutes the material aspect of time cannot be numbered or measured without the operation of the soul; for although a duration can have a certain length or brevity in its own right, this length can only be measured by the soul.<sup>55</sup> However, the role of the soul in numbering does not make time a fiction or a rational being, since “what the soul numbers in motion, it does not invent for itself, but discovers in motion itself.”<sup>56</sup> Pererius believed that in the act of numbering the rational soul ‘discovers’ and counts the element of number in external things. Thus although numbering is a mental activity, its involvement does not make time wholly mind-dependent. Pererius

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<sup>51</sup> *Ibid.*, 386: “... primum effective, quatenus omnes alii motus dependet (sic) a motu caeli, hic autem ab Intelligentia quae a Peripateticis vocatur Anima caeli.”

<sup>52</sup> *Ibid.*, 386: “Deinde, dependet etiam ab anima quatenus de ipsa motu nihil est actu praeter indivisibile quoddam.”

<sup>53</sup> *Ibid.*, 386: “Tempus igitur cum sit re idem atque; motus, materialiter quidem, sumpturn, eodem modo pendebit & non pendebit ab anima atq; motus: & quemadmodum nemo dicet motum esse ens rationis, propter aliquam eius dependentiam ab anima; ita neque de tempore id censeri & affirmari debet.”

<sup>54</sup> *Ibid.*, 386-7: “Formale autem ipsius temporis, necessario eget opera intellectus.”

<sup>55</sup> *Ibid.*, 387.

<sup>56</sup> *Ibid.*, 387: “Nam quod anima numerat in motu, non fingit ipsa sibi, sed in ipso motu reperit...”

therefore posited a radical interdependence between time and the rational soul, in which motion and number, the material and formal aspects of time, are fundamentally related to the soul. He acknowledged that Averroës had identified the material and formal aspects of time, and that he had distinguished “between incomplete being, of which kind is time, and complete being such as man and stone, because the former receives its complement through the operation of the soul, and the latter however scarcely at all”, but he also attributed this argument to Aquinas.<sup>57</sup>

Another version of the Averroist position was presented in the influential Coimbra commentary on the *Physics* by Manuel de Góis, which was first published in 1593.<sup>58</sup> Although he did not mention the material-formal distinction specifically, the Coimbra commentator developed a similar division between the real and mental aspects of time. He argued that when Aristotle and Augustine suggested that time is “a work of the soul, or depends on the soul”, this was “because they consider it not absolutely, but insofar as it is limited in the first mover by the soul, and is prescribed to measure the motions of the sublunar world.”<sup>59</sup> Aristotle and Augustine, he suggested, were thinking of the way in which the soul divides and orders different parts of time into hours and days. As the Coimbra commentator put it, the ‘division and limiting’ of time is done “only by the action of the mind.”<sup>60</sup> So time as it is limited and divided is indeed a rational being, because these divisions are solely mental. But although mental operations play an important role in this account of time, the Coimbra commentator insisted that time ‘viewed absolutely’ is clearly a real being, “since motion persists in its own being in the absence of all apprehension of the intellect, and claims a real and proper duration for itself, which is nothing other than time.”<sup>61</sup>

<sup>57</sup> *Ibid.*, 387: “Hoc enim discrimin est, auctore Averroë 88 comm 4 Phys inter ens completum, cuiusmodi est tempus, & ens completum uti est homo & lapis, quod illud accipit suum complementum per operationum animae, hoc autem minime.”

<sup>58</sup> On the Coimbra commentaries, see de Carvalho, “Concept of Time,” 353–381; *Cambridge History of Renaissance Philosophy*, 814; Lohr, *Latin Aristotle Commentaries*, 98–9.

<sup>59</sup> Collegium Conimbricense, *In octo libros Physicorum... prima pars*, col. 131: “Porro docuit Arist hoc in lib cap 14 text 131 tum D August 11 Confess ca 28 tempus esse opus animae, seu pendere ab anima, quia ipsum considerarunt non absolute, sed prout in primo mobili ab anima limitatur, & praescribitur ad metiendos motus sublunaris mundi.”

<sup>60</sup> *Ibid.*, col. 131: “... illa sectio & limitatio, sola mentis actione fiat...”

<sup>61</sup> *Ibid.*, cols. 131–2: “... cum motus, sublata omni apprehensione intellectus, in suo esse persistat, atque realem, propriamque sibi durationem vendicet; quae non est alia, quam tempus.”

Both Pererius and the Coimbra commentator synthesized the insights of Averroës and Aquinas to produce a model stressing the important contribution made by the soul to the being of time. Outside the Jesuit tradition, the Thomist commentary of the *Collegium Complutense* of Alcalá also discussed Averroës' arguments and identified parallels with Aquinas' theory in them.<sup>62</sup> Nevertheless, like Toletus, the Alcalá commentator concluded that according to Aquinas time is a real being.<sup>63</sup> This was again a reference to the argument that Toletus had accused later Thomists of misunderstanding.<sup>64</sup>

Treatments of the soul in these commentaries were in general schematic and cursory because they focused on the concept of time itself, rather than on the soul. Toletus, Pererius and the Coimbra commentator all elided the intellect (*intellectus*) as a numbering power with the soul (*anima*) itself, and few of them consistently distinguished between the intellect and the soul as a whole. This tendency derived from Aristotle's text itself, and was continued by most late Aristotelian authors. However, some Jesuit commentators discussed whether time relates to the mental faculty of imagination in their treatments of imaginary time (*tempus imaginarium*). Imaginary time was a medieval scholastic extrapolation from Aristotle's *Physics*, which these authors commonly related to imaginary space (*spatium imaginarium*). Imaginary space was originally conceived of as extra-cosmic void space; that is, as an infinite, empty space that preceded the creation of the world, and in which God could be said to exist.<sup>65</sup> However, later Jesuit commentators saw imaginary space as a kind of unreal, infinite space without dimensions, in which natural bodies are contained.<sup>66</sup>

Discussions of the parallels between imaginary time and imaginary space were common both in the Jesuit commentary tradition and in later philosophical textbooks. As Edward Grant has pointed out, in medieval and early modern discussions of imaginary space numerous interpretations of the term "imaginary" were developed over the centuries, ranging

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<sup>62</sup> *Collegium Complutense, Disputationes in Octo Libros Physicorum*, 442.

<sup>63</sup> *Ibid.*, 442–3.

<sup>64</sup> Toletus, *In octo libros Aristotelis de physica auscultatione*, 146r.

<sup>65</sup> Leijenhorst, *Mechanisation of Aristotelianism*, 367; Edward Grant, *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Cambridge: Cambridge University Press, 1981), 116–147.

<sup>66</sup> Cees Leijenhorst, "Jesuit Doctrines of Spatium Imaginarium and Thomas Hobbes' Doctrine of Space," *Early Science and Medicine* 1:3 (1996): 367–373 and Leijenhorst, *Mechanisation of Aristotelianism*, 111–116.

from a mental fiction to an actually existent reality.”<sup>67</sup> The language of ‘imaginary time’ was also inflected in similarly diverse ways. According to Petrus Fonseca’s commentary on Aristotle’s *Metaphysics*, there are,

two universal times, by which all things that are subject to time are measured; one real, which is the same thing as the motion of the first mover...the other, which is usually called imaginary, not because it depends on the imagination and is as if it were nothing except insofar as we imagine it, like a chimera or sphinx, but because it is nothing real, but only a container of all motions [*capedo... motuum omnium*], so to speak: just as place that is called imaginary is nothing other than the container of all bodies.<sup>68</sup>

For Fonseca, imaginary time can be seen to resemble imaginary space because it ‘contains’ real times or durations, in the sense that those times are encompassed within a broader framework: in effect, it is a kind of temporal frame in which real time is located. Late scholastic theories of imaginary space often discussed the notion that imaginary space corresponded to or coincided with the surface limit of a body, and Fonseca also seems to play on this notion of real time corresponding to imaginary time.<sup>69</sup> Fonseca’s terminology here is resonant but also somewhat ambiguous. His use of the word ‘container’ or ‘vessel’ recalled Aristotle’s discussion of place as the surface limit of a containing body in *Physics* IV. Moreover, Fonseca suggested that because imaginary time ‘contains’ real time, “real time receives its rationale from imaginary time, just as real place does from imaginary place.”<sup>70</sup> That is to say, in both cases the imaginary component of space and time frames, or sets in context, the real component. Fonseca implied that imaginary time contains real time insofar as it is composed of multiple individual motions, and insofar as it serves as a kind of framing device for those motions.

The Coimbra commentator advanced a similar concept of imaginary time, which he contrasted to the ‘singular time’ defined by Aristotle, noting that this imaginary time is “also one in being, and universal in

<sup>67</sup> Grant, *Much Ado*, 121.

<sup>68</sup> Petrus Fonseca, *In Metaphysicorum*, col. 733: “...duo esse tempora universalia, quibus mensurantur omnia, quae tempori subsunt; unum reale, quod est idem re cum motu primi mobilis... alterum, quod dici solet imaginarium, non quod a imaginatione pendeat, quasi nullum sit, nisi quatenus illud imaginamur ut Chimera, aut sphinx, sed quia nihil reale est, sed sola capedo, ut ita dicam, motuum omnium; quemadmodum locus, qui imaginarius dicitur, nihil est aliud, quam capedo omnium corporum.”

<sup>69</sup> Leijenhorst, *Mechanisation of Aristotelianism*, 112.

<sup>70</sup> *Ibid.*, col. 744: “Colligimus etiam, tempus reale a tempore imaginario accipere complementum sua rationis, quemadmodum locus realis ab imaginario.”

measuring", and is "older, more equal and more universal."<sup>71</sup> Like Fonseca, the Coimbra commentator related imaginary time to imaginary space, and denied that it might only be a figment of the imagination. Most early modern scholastic authors were careful to delineate the ontological status of imaginary time precisely. For many of them, it was important to distinguish between the idea that imaginary time was a rational being in the sense of being a mental concept or construct used to understand real time, and a notion of imaginary time as fictional or invented. This distinction, which most Jesuit authors upheld, stemmed from the assumption that God existed in imaginary time and imaginary space before the creation of the world; therefore, these forms of time and space could not be wholly unreal. However, some dissented from this view. Roderigo Arriaga, a Spanish Jesuit and Professor of Philosophy at the University of Prague in the 1630s, insisted that imaginary time is "a rational being, or a successive time invented (*fictum*) by us to simulate real time", that resembles imaginary space and which we use to comprehend durations that we cannot understand in themselves.<sup>72</sup> God's eternity is such a duration, because it is inconceivable by any other means.<sup>73</sup> Arriaga seems to have accorded a greater role to the imagination in his account than many other Jesuit commentators. The interpretation of imaginary time as 'imagined time' gained greater currency in the early seventeenth century, and also came to play a significant role in Hobbes' thought, as we shall see.

Discussions of the reality of time using the language of real and rational being were not confined to the comprehensive Jesuit commentaries. Late sixteenth- and early-seventeenth-century textbook authors of various intellectual and confessional allegiances also drew on this discourse in their discussions of time, although often in a less sophisticated way than their Jesuit contemporaries. These authors often structured their

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<sup>71</sup> Collegium Conimbricense, *In octo libros Physicorum... prima pars*, col. 130: "Adverte etiam, praeter hoc tempus singulare, dari aliud, unum quodque in essendo, & univer- sale in mensurando, nempe tempus imaginarium, quod illo est antiquius, aequabilius & universalius."

<sup>72</sup> Roderigo de Arriaga, *Cursus philosophicus* (Antwerp: Ex officina Plantiniana Balthasaris Moreti, 1632), 455: "Respondeo esse ens rationis, seu tempus a nobis fictum successivum ad similitudinem realis; sicut in simili dixi supra de spatio imaginario, ut in ordine ad illud tempus fictum explicemus diversitatem durationum, eo quod non possimus illas in seipsis cognoscere." On Arriaga, see Lohr, *Latin Aristotle Commentaries*, 21–2.

<sup>73</sup> *Ibid.*, 455: "Sicut ergo explicamus immensitatem Dei per ordinem ad spatia imaginaria, id est, quod nullum sit cui Deus non sit praesens; ita etiam durationem aeternam Dei explicamus per tempus imaginarium, id est, ut nullum fuerit, vel poterit vel possit concipi instans, in quo non existit Deus."

discussion around the distinction between the material and formal aspects of time. For example, the German Lutheran author Johann Ludwig Havenreuter's *Compendium librorum physicorum Aristotelis* (1600), argued that,

Just as a sensible thing, in the absence of all sense, can remain according to its subject but not be a sensible, and yet can nevertheless be sensed, if a sense existed; so time in the absence of the numbering soul remains according to its subject, because motion remains, but is nevertheless not the number of motion according to former and latter, and thus the nature and definition of time is abolished.<sup>74</sup>

Textbook authors such as Havenreuter generally presented less detailed or sophisticated accounts of the relationship between time and the soul, which were often parasitic on the Jesuit commentary tradition.<sup>75</sup>

The debate about time as a real or rational being in early modern *Physics* commentaries and textbooks attempted, within certain well-defined limits, to find a role for the soul within the concept of time that was consistent with Aristotle's enigmatic and ambiguous text. The arguments of Aquinas and Averroës were important influences, and many commentators adopted a reading that owed something to both philosophers, arguing that time is neither wholly real nor wholly rational. However, these authors were consistently wary of attributing a solely mental existence to time. They insisted that whilst time may involve mental concepts, it cannot be reduced to them. Their approach to the problem was therefore directed by the assumptions that a wholly mental concept of time is impossible, and that the contribution made by the faculties of the soul to the existence and perception of time was strictly limited. These assumptions produced a model of time that can be characterized as realist

<sup>74</sup> Johann Havenreuter, *Compendium librorum physicorum Aristotelis* (Strasbourg: Typis Iosiae Rihelii, 1600), 121–22: “Quemadmodum enim res sensilis, omni sublatu sensu, manere potest secundum subiectum: sed non sensilis esse, tamen sentiri, si sensus esset: ita Tempus animo numerante sublatu, manet secundum subiectum; quia motus manet, non tamen est numerus motus secundum prius & posterius, & sic natura & definitio temporis aboletur.”

<sup>75</sup> See Deusing, *Naturae theatrum universale*, 392–3; Franco Burgersdijk, *Idea philosophiae naturalis sive methodus definitionum & controversiam physicarum* (Leiden: Ex Officina Elsevir, 1627), 36; Johann Stierius, *Praecepta doctrinae logicae, ethicae, physicae, metaphysicae sphaerique brevibus tabellis compacta* (Cambridge: Ex officina Rogeri Danielis, 1647), 32–3. For the influence of the Coimbra commentary on, for example, John Case, see Sarah Hutton, *Aspects of the Concept of Time in Elizabethan and Jacobean England* (University of London PhD Thesis, 1977) and John Case, *Lapis philosophicus, seu commentarius in octo libros physicorum Aristotelis in quo arcana physiologiae examinantur* (Oxford: Excudebat Josephius Barnesius, 1599).

and rationalist, in which time is real, but the mental faculty of reason is involved in its perception. Much of the secondary literature to date has portrayed this model as more or less representative of late Aristotelian opinion on the subject.<sup>76</sup> However, a different model emerged in a number of early-seventeenth-century textbooks from central and northern Europe and France, which developed an approach to the problem of time and the soul centred on the concept of internal and external time.

### *Internal and External Time*

#### *Suárez and the Categories Commentary Tradition*

The concepts of internal and external time (*tempus internum* and *tempus externum*), also referred to as intrinsic and extrinsic time (*tempus intrinsecum* and *tempus extrinsecum*), originated in medieval scholastic discussions of intrinsic and extrinsic denomination (*denominatio intrinseca* and *denominatio extrinseca*). Extrinsic denomination was usually characterized as the naming of something from outside itself; that is, the definition of a thing or its attributes in terms of its relationship with objects or attributes external to it.<sup>77</sup> Essentially, this was a nominalist position, although for many later scholastic authors it came to imply more than merely the imposition of names if the source of the extrinsic denomination lay in the denominated thing itself.<sup>78</sup> The opposite position—*intrinsic* denomination—suggested that a thing can be understood with reference only to itself and its own properties. Intrinsic and extrinsic denomination were discussed in a wide range of theological and philosophical contexts, but their role in the tradition of commentaries on Aristotle's *Categories* is particularly relevant here. Beginning with the twelfth-century *Liber de sex principiis*, erroneously attributed to Gilbert of Poitiers, some medieval philosophers argued that the final six Aristotelian categories (*actio, passio, quando, ubi, situs, habitus*) were in fact extrinsic denominations.<sup>79</sup> In the case of *Quando* ('when', or 'being in time'), this meant that the category 'when' was considered only in terms of its relationship to other, external

<sup>76</sup> See Leijenhorst, *Mechanisation of Aristotelianism*, 128–137.

<sup>77</sup> John P. Doyle, "Prolegomena to the Study of Extrinsic Denomination in the Work of Francis Suárez, S.J.," *Vivarium* 22 (1984): 122–8.

<sup>78</sup> *Ibid.*, 122.

<sup>79</sup> *Ibid.*, 137; see Pseudo Gilbert of Poitiers, *Liber de sex principiis Gilberto Porretano ascriptus* (Monasterii: Typis Aschendorff, 1929).

things. For most scholastic readers, this position brought to mind arguments found in the *Physics* commentary tradition that time's status as a real being derived from its dependence on celestial motion.

The argument that *Quando* was an extrinsic denomination in some respects resembled the position adopted by many medieval and early modern commentators on *Physics* IV; in effect, it reduced the concept of time to its relationship with external motion. This argument was opposed by those authors who insisted that *Quando*—and, by extension, the concept of time itself—must also involve an intrinsic element. Several sixteenth-century Jesuit authors discussed this question, including Petrus Fonseca and Molina.<sup>80</sup> The most prominent advocate of the argument that time involved an intrinsic denomination was Francisco Suárez, whose discussions of time as a form of continuous quantity and of the category *Quando* in Disputations 40 and 50 of his *Metaphysicarum disputationum* (1597) influenced many later accounts of internal and external time.<sup>81</sup> Suárez's treatment of time and duration ranged quite widely, but his main point was that time necessarily involves an intrinsic element because the relation of extrinsic denomination posits nothing about the thing which is denominated. He contrasted this position with the medieval argument, which he attributed to Gilbert of Poitiers, Aquinas and Domingo de Soto, that time is an extrinsic denomination.<sup>82</sup> However, Suárez also denied that time is a solely intrinsic property, since this would have downplayed the importance of its relationship with motion.

Although his discussion of intrinsic and extrinsic time was distributed amongst several discrete sections of Disputations 40 and 50, Suárez outlined his position in a particularly clear way in Disputation 40 Section 9, which examines how time and motion might be compared. There he argued that

It must be said that the time to which motion can be compared is twofold: one is extrinsic, the other intrinsic. The former is the motion of the heavens

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<sup>80</sup> Pasquale Porro, *Forme e modelli di durata nel pensiero medievale: l'acuum, il tempo discreto, la categoria « quando »* (Leuven: Leuven University Press, 1996), 459–483.

<sup>81</sup> See *inter alia*, Stephen H. Daniel, “Seventeenth-Century Scholastic Treatments of Time,” *Journal of the History of Ideas* 42: 4 (1981): 587–606.

<sup>82</sup> Suárez, *Metaphysicarum disputationum*, 480: “Alia ergo & communia sententia est, Quando solum esse denominationem extrinsecam, provenientem rebus ab extrinseco tempore mensurante. Hanc sequitur D Th in dicto opusc quamvis sub distinctione, & eam significat Gilbertus, nam cum hanc denominationem affectionem appellasset, statim correctionem adiuxit, *ut ita dicam*. Soto etiam in *Logico*, & alii hoc sequuntur. Sed in hac sententia nonnullae occurrent difficultates, quaedam ad hominem, aliae simpliciter.”

with respect to other motions . . . Intrinsic time is the particular and intrinsic duration found in one successive motion, which can be considered in two ways. Firstly, absolutely and according to its real being, and the composition and union, or continuation, of its parts . . . The other manner this duration of motion can be considered is by a comparison with an imaginary succession, which we apprehend as if it were infinite.<sup>83</sup>

Here, Suárez distinguished between the ‘external’ aspect of time—its extrinsic denomination—because it involves a comparison between heavenly and sublunar motions, and intrinsic time, which is simply the unique duration of a particular motion. The ‘imaginary succession’ to which this passage refers offered a way of comparing individual intrinsic times with others, since although the intrinsic time of one thing is particular, Suárez avoids making it wholly incommensurable with other intrinsic times. Unlike many other Jesuit authors, such as the Coimbra commentator, Suárez also considered this succession to be ‘imaginary’ in the sense of ‘imagined’; that is, he believed it to be a rational being that we imagine or conceive of in order to compare different times and motions, although he noted that insofar as it contains real durations it can be seen as real.<sup>84</sup>

Suárez’s emphasis in this passage was on how the concepts of intrinsic and extrinsic duration explain the relationship between different times and motions. In Disputation 50 he developed this language further to encompass the intrinsic and extrinsic times of being in general. The broader discussion of duration in Disputation 50 expanded the concept of intrinsic time, and asserted the connection that Suárez posited between duration and existence. He noted that a particular being’s intrinsic time is not readily distinguishable from its existence, but merely distinct by reason.<sup>85</sup> Since every really existing being will have its own intrinsic duration, as many durations as there are beings will exist.<sup>86</sup> Although his notion of an ‘imaginary succession’ offered a means of comparing these

<sup>83</sup> *Ibid.*, 293: “. . . dicendum est duplex esse tempus, ad quod potest motus comparari: unum est extrinsecum, aliud intrinsecum. Prius est duratio motus coeli respectu aliorum motuum . . . Tempus intrinsecum, est duratio propria & intrinseca in unoquoque motu successio inventa, quae dupliciter etiam considerari potest. Primo, absolute & secundum realem entitatem suam, & partium suarum compositionem & unionem, seu continuationem . . . Alio modo potest considerari illa duratio motus per comparationem, & quasi coexistentiam ad successionem imaginariam, quam nos ut infinitam apprehendimus.”

<sup>84</sup> Daniel, “Seventeenth-Century Scholastic Treatments of Time,” 594–5.

<sup>85</sup> Suárez, *Metaphysicarum disputationum*, 453–4.

<sup>86</sup> *Ibid.*, 472: “Rursus, omnis res quae in esse reali durat, per durationem realem & intrinsecam durat: ergo quaelibet ex his rebus durat per durationem realem sibi intrinsecam: ergo multiplicantur hae durationes iuxta multitudinem earum rerum, quae sic durant.”

intrinsic times, they were nevertheless rooted in the particular existence of individual beings. The notion of multiple, particular intrinsic durations was highly significant for late Aristotelian theories of time. But the notion that every enduring thing possesses a particular duration captured only one aspect of duration for Suárez. These disparate intrinsic durations are united by the extrinsic duration of the heavens, against which they are measured, and which corresponds to Aristotle's concept of time. Suárez related this opinion to the arguments in Section 22 of Chapter 11 of Augustine's *Confessions*.<sup>87</sup>

Stephen Daniel places Suárez's discussion of intrinsic and extrinsic time (which he characterizes as 'fundamentally metaphysical') in the context of the troubling intellectual consequences for late scholastic authors of Copernicus' rejection of Aristotelian and Ptolemaic cosmology.<sup>88</sup> In his view, Copernicus' heliocentric model undermined the assumption underlying most Aristotelian accounts of time—the assumption that a unified picture of time could encompass both the duration of particular bodies or motions and the movement of the heavens, as Aristotle argued. Although, as Daniel concedes, Suárez does not address Copernican arguments explicitly, he sees him as representative of a 'metaphysical' tradition in scholastic theories of time that foregrounded duration rather than physical motion or its measure.<sup>89</sup> Whilst this Copernican context is clearly significant, I argue that in Suárez's case the implications of his arguments within late scholastic discourse were also relevant. This was not just, as Daniel argues, a debate about time-measurement and celestial motion, but also, for many of its late Aristotelian readers, one with implications for time's connection to the soul.

Suárez's discussion of intrinsic and extrinsic time, which for him are topics located definitely within metaphysics, influenced other *Categories* commentaries, particularly those from the Iberian peninsula.<sup>90</sup> Suárez himself acknowledged the consonance between his approach and positions found in Augustine, Scotus and the medieval tradition, but his account became the most recognisable and influential version of the

<sup>87</sup> *Ibid.*, 472.

<sup>88</sup> Daniel, "Seventeenth-Century Scholastic Treatments of Time," 589.

<sup>89</sup> *Ibid.*, 589.

<sup>90</sup> Porro, *Forme e modelli di durata*, 459–61; Collegium Conimbricense, *Commentarii Collegii Conimbricensis ex Societate Iesu in universam Dialecticam Aristotelis Stagiritae* (Cologne: Apud B. Gualterium, 1611), cols. 527–530; Johannes Baptista Rubeus, *Commentarii in universam Aristotelis Dialecticam: una cum dubiis & quæstionibus hac tempestate agitari solitis...* (London: Typis Tho. Harper, impensis Rich. Whitaker, 1641), 239–240, 242–244.

argument that time comprises both internal and external elements. Since this part of the *Metaphysicarum disputationum tomi duo* considered time and duration both in terms of the category *Quando* and as concepts that related to the fundamental metaphysical building-blocks of *ens* and *essentia*, Suárez had relatively little to say about the connection between time and the soul.<sup>91</sup> However, a number of natural philosophy and metaphysics textbook authors from across Europe who were influenced by Suárez combined his concepts of intrinsic and extrinsic duration with the language of real and rational time familiar from the *Physics* commentary tradition to produce interesting and eclectic syntheses that often offered new insights into the connection between time and the soul. Daniel views this process as part of an attempt to move discussions of time from metaphysics to natural philosophy—but, as I will argue, the dynamics of these debates were in fact more complex. In particular, the concept of intrinsic or internal time was fleshed out by some authors to connect it even more directly with the being upon which it depended, and this reformulation had implications for the Aristotelian conception of time's relationship to the soul.

*Internal and External Time in the Textbook Tradition:  
Northern and Central Europe*

An early example of this reformulation of the idea of intrinsic and extrinsic time appeared in the Calvinist author Clemens Timpler's *Metaphysicae systema methodicum*, which was first published in 1604.<sup>92</sup> Timpler's work, like many contemporary German textbooks, engaged in a complex manner with Suárez's metaphysics.<sup>93</sup> Timpler (1563/4–1624), who taught at

<sup>91</sup> Costantino Esposito, "The Concept of Time in the Metaphysics of Suárez," in *The Medieval Concept of Time*, ed. Porro, 383–398.

<sup>92</sup> On Timpler, see Joseph Freedman, *European Academic Philosophy in the Late Sixteenth and Early Seventeenth Centuries: The Life, Significance and Philosophy of Clemens Timpler (1563/4–1624)* (Hildesheim: Georg Olms, 1988); Peter Petersen, *Geschichte der Aristotelischen Philosophie in Protestantischen Deutschland* (Stuttgart-Bad Cannstatt: Friedrich Frommann Verlag, 1964), 286; Max Wundt, *Die deutsche Schulmetaphysik des 17. Jahrhunderts* (Tübingen, Verlag von J.C.B. Mohr, 1939), 72–80; Siegfried Wollgast, *Philosophie in Deutschland zwischen Reformation und Aufklärung 1550–1650* (Berlin: Akademie-Verlag, 1988), 189–190.

<sup>93</sup> Suárez's *Metaphysicarum disputationum tomi duo* was first published for a German audience in Mainz in 1600; other editions appeared at Mainz in 1605, 1614 and 1630, and at Cologne in 1608 and 1614; Charles H. Lohr, "Metaphysics," in *Cambridge History of Renaissance Philosophy*, 627–8. On the influence of Suárez and other Iberian Jesuits on German philosophy in this period, see Karl Eschweiler, "Die Philosophie der spanischen

Heidelberg University and was then Professor of Philosophy at the Gymnasium in Steinfurt, argued that time is a species of duration, “simply the finite and mutable duration of created being.”<sup>94</sup> It therefore relates to the properties of “being insofar as it is being (*passiones seu proprietates entis quatenus est ens*).” Timpler defined duration as “the remaining of being in the act of existing”: his account of time thus depended on the concept of being itself.<sup>95</sup> The *Metaphysicae systema methodicum* divided time into its real and imaginary elements. Real time “is that which is truly found outside the intellect,” whereas imaginary time “is that which is made only by the thought of the mind, and is nothing beyond that.”<sup>96</sup> Imaginary time for Timpler is wholly mental and fictional, has only “imaginary essence and existence,” and is thus a rational being.<sup>97</sup> Timpler accepted the common analogy between imaginary time and imaginary space, and his account also echoed the idea of comparing real or intrinsic times within an imaginary succession found in Suárez’s metaphysics:

Because just as for bodies man imagines and conceives of some permanent and immobile space, of which any body existing in place fills some part: thus in a succession of times he necessarily imagines and conceives of some space that is flowing and transient, to some part of which every real time coexists and corresponds, or at least some part of it. This is nothing other than imaginary time.<sup>98</sup>

Real time is thus the duration of a being, but imaginary time is imagined by a *subject* that endures in real time.

Timpler identified two forms of real time: intrinsic and extrinsic time (*tempus intrinsecum* and *tempus extrinsecum*). Intrinsic time is “the duration through which created being truly remains in its own existence,” and

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Spätscholastik auf den deutschen Universitäten des siebzehnten Jahrhunderts,” *Spanische Forschungen der Görres-gesellschaft* 1 (1928): 231–325; Wundt, *Die deutsche Schulmetaphysik*, 41, 59–61; Wollgast, *Philosophie in Deutschland*, 154–5, 180–3.

<sup>94</sup> Clemens Timpler, *Metaphysicae systema methodicum libri quinque* (Hanau: Apud Guilielmum Antonium, 1606), 53: “Tempus est duratio simpliciter finita & mutabilis entis creati...”

<sup>95</sup> *Ibid.*, 53: “Duratio est permanens entis in actu existendi.”

<sup>96</sup> *Ibid.*, 53: “Tempus reale est quod revera extra intellectum reperitur.”; “Tempus imaginarium est quod sola mentis cogitatione fingitur, & extra eam nihil est.”

<sup>97</sup> *Ibid.*, 68: “...essentiam & existentiam imaginarium.”

<sup>98</sup> *Ibid.*, 68: “Quia sicut corporibus homo fingit & concipit spatium quoddam permanentis, & immobile cuius aliquam partem replet quodlibet corpus in loco existens: ita in successione temporum fingit & concipit spatium quoddam necessario fluens & transiens cuius alicui parti coexistit & respondet omne tempus reale saltem pars aliqua illius. Id quod nihil aliud est quam tempus imaginarium.”

is a property of individual natural bodies or natural accidents.<sup>99</sup> Extrinsic time, on the other hand, “is a certain and determined duration instituted partly by the will and design of God and partly of wise men to measure and mark intrinsic time.”<sup>100</sup> Its species are the acknowledged, conventional divisions of time—hours, days, months, years and seasons.

Different created beings cannot share a single intrinsic time, because intrinsic time relates to the particular durations of individual bodies.<sup>101</sup> As any created being has a distinct, individual being and existence, its duration must therefore also be particular to it, and distinct from those of other beings. Intrinsic time—the duration of the existence of different created beings—is thus particular to those beings. When we say that time is common to several beings, Timpler argued, we can be considering only extrinsic time. For although several actions may occur in one hour of extrinsic time, individual beings that act or are acted upon must exist in their own particular intrinsic times.<sup>102</sup> Extrinsic time therefore connects the unique and incommensurable temporal experience of a multitude of created beings. Its basis is the motion of the stars and planets—the Sun and moon, in particular. Intrinsic time, on the other hand, depends on the existence of sublunar beings alone, and “after the last judgement the intrinsic time of angels and men will indeed remain, but extrinsic time will be abolished.”<sup>103</sup>

The differences between intrinsic and extrinsic time also produced a disciplinary division, since Timpler suggested in his *Physicae seu Philosophiae Naturalis Systema Methodicum* (1607) that extrinsic (or external) time and its conventional divisions belongs to astronomy, whereas intrinsic

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<sup>99</sup> *Ibid.*, 53: “Intrinsicum tempus est duratio per quam ens creatum revera in sua existentia permanet.”

<sup>100</sup> *Ibid.*, 53: “Extrinsicum tempus est duratio certa ac determinata partim Dei partim hominum sapientium voluntate & consilio instituta ad mensurandum & notificandum tempus intrinsicum.”

<sup>101</sup> *Ibid.*, 65–6.

<sup>102</sup> *Ibid.*, 66: “Neque obstat quod vulgo alii una & eodem numero hora dicuntur nasci, alii mori, alii ridere, alii plorare. Hoc enim intelligendum est de tempore extrinseco quo tempora intrinsicae entium creatorum mensurantur.”

<sup>103</sup> *Ibid.*, 67: “Hinc post extremum iudicium tempus intrinsicum quidem angelorum & hominum manebit; extrinsecum vero absolebitur teste angelo Apocalyps. 10. v. 6.” The biblical passage reads “Et angelum quem vidi stantem supra mare et supra terram levavit manum suam ad caelum et iuravit per viventem in saecula saeculorum qui creavit caelum et es quae in illo sunt et terram et ea quae in ea sunt et mare et quae in eo sunt quia tempus amplius non erit” in the Vulgate.

(or internal) time belongs to metaphysics.<sup>104</sup> This division between time as a property of bodies and time as the subject of exact calculation was preserved by many other contemporary textbook authors. Timpler's treatment of time therefore related it to duration rather than to motion, argued for the mind-dependence of imaginary time, and also suggested that particular beings have an individual, 'private' time. His use of the concepts of intrinsic and extrinsic time also allowed him to argue that time is both real and rational, celestial and corporeal, general and individual.

Timpler's metaphysics textbook was very widely read across Europe, particularly in Germany, and appeared in a number of editions at the beginning of the seventeenth century.<sup>105</sup> His treatment of intrinsic and extrinsic time was echoed by several central European contemporaries, most of whom drew on his published work, or had personal contact with him.<sup>106</sup> The first was almost certainly Rodolphus Goclenius the elder (1547–1628), who was Professor of Physics at Marburg university from 1581 onwards.<sup>107</sup> Goclenius wrote a commentary on the *Metaphysicae Systema Methodicum* that appeared in all editions of Timpler's work after 1606.<sup>108</sup> Whilst he accepted that "duration is the permanence of being in existence," Goclenius criticized several aspects of Timpler's treatment of time.<sup>109</sup> He discussed Timpler's distinction between what he called 'internal' and 'external' time in more typically Aristotelian terms. What the scholastics call internal time, he suggested, is that which is internal to things themselves.<sup>110</sup> External time, on the other hand, is an 'external circumstance' that Goclenius related to the Peripatetic definition of time as

<sup>104</sup> Clemens Timpler, *Physicae seu philosophiae naturalis systema methodicum, in tres partes digestum* (Hanau: G. Antonius, 1607), 187–8.

<sup>105</sup> See Freedman, *European Academic Philosophy*, 92–124; Wollgast, *Philosophie in Deutschland*, 154–5. The *Metaphysicae Systema* was published at Steinfurt in 1604 and at Hanau in 1606, 1608, 1612 and 1616. Unauthorized editions appeared at Lich in 1604, Frankfurt in 1607 and also at Marburg in 1607.

<sup>106</sup> Timpler's concept of intrinsic and extrinsic time was also discussed by the Oxford puritan divine Richard Crakanthorpe. Richard Crakanthorpe, *Introductio in Metaphysicam* (Oxford: Excudebant Johannes Lichfield, & Jacobus Short, 1619), 69.

<sup>107</sup> See Freedman, *European Academic Philosophy*, 92; Cambridge History of Renaissance Philosophy, 821; Petersen, *Geschichte der Aristotelischen Philosophie*, 287.

<sup>108</sup> Freedman, *European Academic Philosophy*, 92n30.

<sup>109</sup> Rodolphus Goclenius, *In M. Clementis Timpleri metaphysicam praefatio* (Hanau: Apud Guilielmum Antonium, 1606), 6: 'Duratio est permansio entis in existentialia...'

<sup>110</sup> *Ibid.*, 7: "Internum vocant quod rebus ipsis interne est, tanquam adiunctum quo subiecto inhaerens."

the measure of motion.<sup>111</sup> Moreover, he argued that external time “is most properly said to be time, that is the successive external duration measuring the motion or permanence of a thing; such is celestial time, or motion depending on it.”<sup>112</sup> Goclenius’ choice of language here is interesting. He transformed the distinction between intrinsic and extrinsic time familiar from Suárez and the *Categories* tradition, and which Timpler used in his metaphysics textbook, into one between internal and external time. The concepts of internal and external place were also familiar from medieval debates, so it is possible that he adopted this terminology.<sup>113</sup> Although for Suárez the language of intrinsic and extrinsic duration signalled his engagement with a specific philosophical tradition, later textbook authors such as Goclenius used this terminology more loosely, eliding these terms with ‘internal’ and ‘external’ time.

Despite his reservations about Timpler’s arguments, Goclenius preserved the distinction between internal and external time in his own later work. His influential *Lexicon philosophicum* (1613) defined time as “the duration, simply understood and changeable, of created being, or at least of natural being.”<sup>114</sup> Goclenius suggested here that “time is external or internal: external time is the certain and definite duration for measuring internal time. Aristotle and his interpreters understand this in the *Physics*, when they say that time is the measure of motion: [and] is the number of motion, that is, numbered by the intellect according to former and latter.”<sup>115</sup> Internal time, on the other hand, is “the duration, through which created Being or at least natural Being truly remains in its own existence.”<sup>116</sup> In his philosophical dictionary, Goclenius preserved the idea advanced in his commentary on Timpler’s *Metaphysicae Systema* that external time is the more proper definition of time. Ultimately, Goclenius’ discussion of internal and external time, both in his early commentary and his later substantive work, emphasized its more orthodox Aristotelian elements.

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<sup>111</sup> *Ibid.*, 7: “Externum vero, quod est externa circumstantia . . . ; motus vero ipsius rei cui adhibetur; mensura tanquam mensurato, unde Peripatetici aiunt, tempus esse motus mensuram, Tempus mensurare motum.”

<sup>112</sup> *Ibid.*, 7: “Sed tempus externum maxime proprie dictum tempus est, i.e. duratio successive external metiens rei motum vel permanentium; tale est caeleste, vel ab hac pendens.”

<sup>113</sup> Grant, *Much Ado*, 15–23.

<sup>114</sup> Goclenius, *Lexicon philosophicum*, 1121: “Tempus accipitur proprie & improprie. Proprie a Peripateticis plerisque pro duratione simpliciter sumpta & mutabili Entis creati, vel naturalis saltem.”

<sup>115</sup> *Ibid.*, 1121.

<sup>116</sup> *Ibid.* 1121: “Internum tempus est duratio, per quam Ens creatum, vel saltem naturale revera in sua manet existentia.”

This is a point supported by Goclenius' edition of his former pupil Bruno Seidel's *Physica* (1596), where he also apparently endorsed the orthodox Aristotelian account of time.<sup>117</sup>

The concept of internal and external time also appeared in the textbooks of Bartholomaeus Keckermann (1571–1609), who was Timpler's pupil at Heidelberg in the late sixteenth century and went on to be Professor of Philosophy at the Danzig Gymnasium.<sup>118</sup> Keckermann's textbooks were widely published and circulated until the early 1660s.<sup>119</sup> Given their personal connections, it seems likely that the discussion of time in his *Systema Physicum*, which was first published in 1610, drew on Timpler's work. Keckermann argued that time, together with place, is one of the two circumstances of natural bodies.<sup>120</sup> It is either internal (*internum*) or external (*externum*). The difference between the two forms of time is obvious, he suggested, because "every body has its own duration, and what is more its own progression from beginning to end, even if it is not compared to the motion of the Sun or of the other stars, by whose rotations hours, days, months and years are enumerated."<sup>121</sup> This progression is internal time, or "the internal measure of a natural body, through which a natural body begins from a certain beginning, and from that beginning proceeds to a certain end-point at which it finishes."<sup>122</sup> In living bodies, this progression equates to "the internal progress of our life, from the first point of birth all

<sup>117</sup> Bruno Seidel, *Physica* (Frankfurt: Ex Officina M. Zachariae Palthenii, 1596).

<sup>118</sup> On Keckermann, see Joseph Freedman, "The Career and Writings of Bartholomew Keckermann (d. 1609)," *Proceedings of the American Philosophical Society* 141: 3 (1997): 305–364; Wundt, *Der deutsche Schulmetaphysik*, 70–1; Wollgast, *Philosophie in Deutschland*, 169–173. Keckermann's theory of internal and external time was also amongst the theses defended by his student Daniel Patterschen at Danzig in 1603. See Bartholomaeus Keckermann, *Disputationes philosophicae, physicae praesertim, quae in Gymnasio Dantiscano ad lectionem philosophicarum cursum paulo plus biennio publice institutae & habitae sunt, sub praesidio Bartholomaei Keckermannii philosophiae in eodem Gymnasio Professoris* (Hanau: Apud Guilielum Antonium, 1606) and also R.J.W. Evans, "German Universities After the Thirty Years War," *History of Universities* 1 (1981): 169–90 on German university disputationes.

<sup>119</sup> Freedman, *European Academic Philosophy*, 123.

<sup>120</sup> Bartholomaeus Keckermann, *Operum omnium quae extant tomus primus* (Geneva: Apud Petrum Aubertum, 1614), col. 1378.

<sup>121</sup> *Ibid.*, col. 1378: "Quod tempus in Internum & Externum distingui debeat, facile ex eo intelligitur, quod omne corpus habeat suam durationem, atque adeo progressum suum a principio ad finem, etiamsi non comparetur ad motum Solis vel alterius stellae, cuius circumgyratione dinumerentur horae, dies, menses, anni."

<sup>122</sup> *Ibid.*, col. 1378: "Tempus interno est mensura interna corporis naturalis, per quam corpus naturale certo principio incipit, & ab isto principio progreditur ad certum finem quo definit."

the way to the moment of death.”<sup>123</sup> As a result, our awareness of internal time is also kind of self-awareness, since it derives from our awareness of the course of our life. We are all aware of the progress of our life, Keckermann argued, even if we are ignorant of heavenly motion, for

Many people understand internal time who do not measure their own time by the certain motion of the Sun and by certain years, and know that they have lived for a long time and endured and been in time, even if they do not know for how many years, or for how much external time they have lived.<sup>124</sup>

This conception of internal time depends on our self-consciousness, since, as Keckermann put it, those who recognize it recognize “that they have . . . endured and been in time,” and is therefore independent of external measures. Unlike Timpler, who believed that internal time cannot be known without external time, Keckermann suggested that the experience of our life and of the continuing duration of our own body provides sufficient evidence of its existence. Our awareness of internal time can therefore be characterized as a kind of self-reflection, in which the soul knows internal time by recognizing the duration of the body and soul together. Keckermann did not believe internal time to be reflexive in the same way as Galen, who made time an awareness of mental motion. Instead, his concept of internal time involved the soul reflecting on the duration of the body and soul as a unity.

External time, on the other hand, “is the measure through which the duration of a natural body and, what is more, even its motion and rest are measured and are distinguished by the motion of some body situated outside the body that endures.”<sup>125</sup> It is “nothing other than the measure or measuring, by which not only the existence but also the motion and rest of a natural body is distinguished and numbered according to the motion of another body, for example by the heavens.”<sup>126</sup> The external time “of man or of human life” is therefore:

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<sup>123</sup> *Ibid.*, col. 1378: “Sic tempus internum in viventibus corporibus est ipse progressus internum vitae nostrae, a primo puncti nativitatis usque ad momentum mortis.”

<sup>124</sup> *Ibid.*, cols. 1378–9: “Quod tempus internum multi intelligent, qui non mensurant tempus suum ad certum motum Solis & ad certos annos, & sciunt se diu vixisse & durasse, & fuisse in tempore, etiamsi non sciunt, quot annis, sive quanto tempore externo vixerint.”

<sup>125</sup> *Ibid.*, col. 1379: “Tempus externum est mensura, per quam corporis naturalis duratio atque adeo etiam motus & quies mensuratur, & distinguitur ad motum alicuius corporis, extra corpus quod durat, positi.”

<sup>126</sup> *Ibid.*, col. 1379: “Tempus externum nihil aliud est quam mensura sive mensuratio, qua corporis naturalis tum existentia, tum motus & quies distinguitur ac numeratur, secundum motum alterius corporis, e.g. ad coeli.”

a certain measure in the motion of the heavens, by which the course of that human life is measured through the intervals of years, months, days and hours, just as I can say that a man has lived for so many years, months, days and hours, and these years, months, and days are distinguished from the motion of the heavens.<sup>127</sup>

External time is divided into primary and secondary elements. Primary external time "is the measure, by which the succession and motion and rest of lesser bodies is measured and distinguished through the motion of the first heaven or of the first mover and of the two primary Planets, i.e. the Sun and Moon, but mainly the Sun."<sup>128</sup> Secondary external time, however, relates to the construction and division of the intervals of time derived from heavenly motion. It is "that by which the succession and intervals of motion in those celestial bodies is measured, through the motion of some body situated on the earth, not for the sake of those celestial bodies, but for the sake of our sense and easier apprehension of time."<sup>129</sup> Secondary external time is the time of clocks and other artificial measuring devices, and is consequently less perfect than primary external time: Keckermann used the example of an ancient clepsydra, or water-clock.<sup>130</sup>

Keckermann also distinguished between the material and formal aspects of external time. Its material aspect "is the thing itself that measures. The formal aspect, is that very measuring."<sup>131</sup> He clarified this point by suggesting that "the heavens and the motion of the heavens is the material aspect of time: however that power and order of measuring the duration of inferior bodies is the formal aspect of time."<sup>132</sup> Keckermann used this distinction as the basis of a discussion of the role of number and measure in

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<sup>127</sup> *Ibid.*, col. 1379: "Sic tempus externum hominis ac vitae humanae est mensura certa in motu coeli, qua per intervalla annorum mensium, dierum & horarum mensuratur cursus iste vitae humanae, ut possim dicere hominem vixisse tot annis, mensibus, diebus & horis, qui anni menses, dies, distinguuntur ex motu coeli."

<sup>128</sup> *Ibid.*, col. 1379: "Primario dictum est mensura, qua per motum primi coeli sive primi mobilis & duorum primariorum Planetarum, Solis nempe & Lunae, sed Solis in primis, inferiorum corporum successio motusque & quies mensuratur & distinguuntur."

<sup>129</sup> *Ibid.*, col. 1380: "Tempus externum secundarium est, quo, per motum alicuius corporis in terra positi, mensuratur successio atque intervallum motus in ipsis corporibus coelestibus, non propter ipsa corpora coelestia, sed propter nostra sensum & faciliorem temporis cognitionem."

<sup>130</sup> *Ibid.*, col. 1380: "Itaque destillatio ista aquae quae guttatum fiebat, erat tempus externum, sive erat mensura tum corporum coelestium, quae horas primaro constituunt, tum etiam actionemistarum quae ad clepsydram fiebant."

<sup>131</sup> *Ibid.*, col. 1379: "Materiale est ipsa res quae mensuratur. Formale, est ipsa mensuratio."

<sup>132</sup> *Ibid.*, col. 1380: "E.g. coelum & coeli motus est materiale temporis: vis autem illa & ordo mensurandi inferiorum corporum durationem, est formale temporis."

time, in which he concluded that the formal aspect of time is not strictly a number, but rather a “measure distinguished by numbers.”<sup>133</sup>

Keckermann also derived the difference between internal and external time from Biblical precedents.<sup>134</sup> The history of creation, he argued, shows that “the Sun, and the other stars that make external time, were created by God not before the fourth day.”<sup>135</sup> External time therefore began on the fourth day. However, he noted, if time were merely external, “of which alone natural philosophers are accustomed to discuss,” it would follow that all the other bodies created before the fourth day were not in time.<sup>136</sup> This, however, would be an absurd conclusion, not least because it would attribute eternity to created beings. For Keckermann, then, the nature of creation implied that the Aristotelian notion of time as a purely external measure cannot be correct. There must be another, internal, experience of time that accounts for the temporality of bodies created before the heavens. Like Timpler, he argued that internal time existed before heavenly motion began, and will continue after it stops: “And in another life we will be beyond the Sun, the Moon and the remaining stars, and what is more we will not be confined by external time.”<sup>137</sup> Internal time for Keckermann was not only the time of self-consciousness and of life, but also the time of the after-life; like the separated intellectual soul to which it relates, it survives after death.

Keckermann’s argument here should be read in the context of discussions of the problem of time in contemporary biblical criticism. Many early modern commentaries on Genesis considered how the creation of the heavens on the fourth day related to the Aristotelian physics of time. This problem was addressed by a number of well-known commentators, such as Benedictus Pererius, David Pareus and Gervase Babington.<sup>138</sup> One

<sup>133</sup> *Ibid.*, col. 1380: “Est itaque tempus non numerus proprius dictus, sed mensura numeris distincta.”

<sup>134</sup> Keckermann made a similar argument about place; *Ibid.*, col. 1377.

<sup>135</sup> *Ibid.*, col. 1378: “Et, si nihil aliud esset quo possemus hanc distinctionem confirmare, abunde sufficeret historia creationis, in qua testatur Moyses, Solem & alias stellas quae tempus externum faciunt, quarto demum die fuisse a Deo creatus . . .”

<sup>136</sup> *Ibid.*, col. 1378: “Quod si ergo nullum esset tempus aliud quam externum, de quo solo solent Physici tradere, sequeretur profecto, terram & aquam atque adeo aërem, id est corpora illa omnia quae primo, secundo & tertio die fuerunt creata, non fuisse in tempore.”

<sup>137</sup> *Ibid.*, col. 1378: “Et in altera vita erimus supra Solem, Lunam & astra reliqua, adeoque non circumscribemur tempore externo . . .”

<sup>138</sup> Benedictus Pererius, *Commentariorum et disputationum in Genesim, tomi quatuor* (Cologne: Ex Officina Antonii Hierati, sub Monocerote, 1606), 25; David Pareus, *In Genesim Mosis commentatorius* (Frankfurt: In Officina Ioanae Rhodii, 1615), cols. 46, 101, 197; Gervase Babington, *Certaine Plaine, Briefe, and Comfortable Notes, Upon Every Chapter of Genesis*

of the most detailed accounts, however, occurred in Hieronymus Zanchius' *De operibus Dei* (1602), which attempted to refound Aristotelian physics in accordance with the book of Genesis.<sup>139</sup> Zanchius associated time with the real duration of created things. Time, he argued, was primarily the 'space of duration' of created things, and secondarily that duration as it is observed by man and distinguished into moments, hours and days.<sup>140</sup> Zanchius' answer to the problem of time and the fourth day was that, in the absence of celestial motion, the duration of the motion of light, which God created on the first day, constituted time.

Keckermann first approached the problem of time and the soul from the perspective of external time, arguing that,

In order that we may explain this problem clearly, it must be known that there are two [aspects] in time: firstly that power of measuring, which has its own indeterminate intervals: secondly, a certain distinction of those intervals, i.e. by which those intervals have a definite longitude or brevity.<sup>141</sup>

To an extent, this distinction follows the division between primary and secondary external time. The 'power of measuring' (*vis mensurandi*) and its associated indeterminate intervals of time do not depend on the rational soul, "because even if no man were to know that the heavens moved, nevertheless they would truly be moved and would distinguish the times

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(London: Thomas Charde, 1596), 7–8; see also A. Williams, *The Common Expositor: An Account of the Commentaries on Genesis 1527–1633* (Chapel Hill: University of North Carolina Press, 1948), 41–44.

<sup>139</sup> Hieronymus Zanchius, *De operibus Dei intra spacium sex dierum creatis opus tres in partes distinctum* (Neustadt: Apud Nicholaum Schraummium, Impensis Haeredum Wilhelm Harnisii, 1602). The project of reconciling Scripture with natural philosophy was widespread in the early seventeenth century; see Ann Blair, "Mosaic Physics and the Search For a Pious Natural Philosophy in the Late Renaissance," *Isis* 91:1 (2000): 32–58 and Conradus Aslacus, *Physica & ethica Mosaica, ut antiquissima, ita vere Christiana, duobus libris* (Hanover: Typis Wechelianis, Apud Haeres Ioannis Aubtii, 1613). On Zanchius, see Lohr, *Latin Aristotle Commentaries*, 503–4.

<sup>140</sup> Zanchius, *De operibus Dei*, 348: "Bifarium autem de Tempore loqui possumus. Primum quidem in genere, quatenus Tempus spatium quoddam est durationis rerum conditum, mensuraque certa ipsi motui cum primis insita, qua ipse & singulæ eius particulae, etiamsi reipsa a nullo intellectu mensurarentur, mensurabiles tamen sunt per se... Alter modus est, quo consideratur Tempus, quatenus creatis iam hominibus reipsa observatum fuit, & distinctum in momenta, in horas, in dies, in hebdomadas, in menses & annos, quibus in rebus nonnulla etiam varietas, apud varias gentes spectata est, & spectatas adhuc."

<sup>141</sup> Keckermann, *Operum omnium... tomus primus*, col. 1380: "Quem nodum ut perspicue expediamus, sciendum est in tempore duo inesse: primo ipsam vim mensurandi, quae sua habet indeterminata intervalla: Secundum, distinctionem certam istorum intervallorum, qua nempe illa intervalla definitam habent longitudinem aut brevitatem."

of things.”<sup>142</sup> Heavenly motion, or primary external time, is therefore independent from the soul. Here, Keckermann reasserted the Scriptural proof, arguing that “since man was created not before the sixth day,” and the motion of the heavens “that distinguishes the external times of things” was created only on the fourth day, heavenly motion could not depend on the soul of man.<sup>143</sup> However, the distinguishing of the general, indeterminate intervals of heavenly motion into specific intervals such as hours, days, and years, which he referred to as secondary external time, does depend on the rational soul, “for unless man were to exist, the motion of the heavens would never be distinguished into certain and various years, months, days and hours. For it is by man that twelve months and 365 days are attributed to a year.”<sup>144</sup> The conventional divisions of time, he suggested, vary between peoples and cities because they are rational and wholly mind-dependent. Keckermann’s theory of time therefore distinguished between a semi-independent time of life and of natural bodies (internal time), a real time that depends on celestial motion (primary external time), and a rational, mind-dependent time (secondary external time). In this way, he combined Aristotelian assumptions about time and celestial motion with more eclectic elements.

Keckermann’s theory of internal and external time in the *Systema Physicum* was an important influence on the account of time in Johann Heinrich Alsted’s *Scientiarum Omnium Encyclopedia*. Alsted’s encyclopedia was first published in 1630 and was read widely across Europe from the middle to late seventeenth century.<sup>145</sup> Alsted (1588–1638) was Professor of Philosophy at Herborn University, a pupil and friend of Keckermann, and the editor of Keckermann’s posthumous *Opera Omnia*. The structure of Alsted’s encyclopedia also owed much to Keckermann’s project for a methodical system of knowledge.<sup>146</sup> Alsted offered two definitions of time in his encyclopedia. Time, he argued, “is the number and measure of

<sup>142</sup> *Ibid.*, cols. 1379–80: Quod ad vim mensurandi attinet, atq; adeo ad intevallum temporis indeterminatum, non pendet tempus ab anima rationali: quia etiamsi nullus hominum cogitaret coelum moveri, tamen revera moveretur & distingueret rerum tempora.”

<sup>143</sup> *Ibid.*, col. 1380: “Et cum homo sexto demum die creatus sit, non potuit motus coeli, qui quarto die coepit & iam tum externa rerum tempora distinxit, non potuit inquam, iste motus coeli qui fuit ante hominem, pendere ab hominis anima.”

<sup>144</sup> *Ibid.*, col. 1380: “... nisi enim homo fuisset, nunquam motus coeli fuisset distinctos per annos, menses, dies, horas certas & varias. Nam ab homine hoc est, quod anno sint attribui menses 12. dies 365.”

<sup>145</sup> Wollgast, *Philosophie in Deutschland*, 195–6.

<sup>146</sup> Howard Hotson, *Johann Heinrich Alsted 1588–1638: Between Renaissance, Reformation and Universal Reform* (Oxford: Clarendon Press, 2000), 29–36.

motion according to former and latter: *or*, it is the successive duration of motion."<sup>147</sup> Its species are internal and external time. Internal time "is the intrinsic measure of a natural body, flowing from a certain beginning to its end."<sup>148</sup> External time, on the other hand, "is the external measure of a body, depending on the motion of the heavens. And thus is it called primary time, to which is opposed secondary external time, that depends on a body situated somewhere on the earth, as on an hour-glass."<sup>149</sup> Alsted followed Keckermann almost exactly here. He also echoed Keckermann in distinguishing internal and external time in terms of their relationship to the soul, insisting that whilst "Internal time has a basis in natural things, external time depends on the intellect."<sup>150</sup> However, as the presentation of two distinct models of time at the beginning of his account suggests, Alsted's treatment of this topic was in many respects confused and fragmentary. He failed to reconcile the model of internal and external time that he derived from Keckermann with the connection between time and motion inherited from earlier Aristotelian authors, producing the slightly confusing argument that external time depends both on celestial motion and on the operation of the intellect. In general, his discussion of internal and external time was not the most coherent contemporary account, and lacked the sophistication of Keckermann and Timpler's accounts of being in time.

Timpler, Goclenius, Keckermann and Alsted were all part of the same central European late-scholastic tradition, with Calvinist religious sympathies.<sup>151</sup> They have also commonly been characterized as engaging

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<sup>147</sup> Johann Heinrich Alsted, *Scientiarum omnium encyclopaedia* (Lyon: Sumptibus Ioannis Antonii Huguetan Filii, & Marc Antonii Ravard, via Mercatoria ad Insigne Sphaerae, 1649), 110: "Tempus est numerus & mensura motus secundum prius & posterius: *seu*, est motus duratio successiva."

<sup>148</sup> *Ibid.*, 110: "Tempus internum est mensura intrinseca corporis naturalis, a certi principii fluxu ad finem ipsius."

<sup>149</sup> *Ibid.*, 110: "Tempus externum est mensura corporis externa, pendens a motu coeli. Et hoc dicitur tempus primarium cui opponitur tempus externum secundarium, quod pendet a corpore alicuius in terra posito, ut a clepsammio."

<sup>150</sup> *Ibid.*, 111: "Tempus internum habet fundamentum in rebus naturalibus, externum dependet ab intellectu."

<sup>151</sup> Howard Hotson, *Johann Heinrich Alsted*. The religious allegiance of Keckermann has been debated, however: see Ian Maclean, "Language in the Mind: Reflexive Thinking in the Late Renaissance," in *Philosophy in the Sixteenth and Seventeenth Centuries: Conversations With Aristotle*, ed. Constance Blackwell and Sachiko Kusukawa (Aldershot: Ashgate, 1999), 300n10.

with Ramist or Philipo-Ramist positions on logic and method.<sup>152</sup> Cees Leijenhorst has connected their positions on space and place both to Calvinist Eucharistic theology and to Ramus' discussion of these topics.<sup>153</sup> In the case of time, however, looking to these influences is less helpful. Ramus himself did not formulate a substantive position on time, but merely criticized what he saw as Aristotle's unsatisfactory and illogical account in *Physics* IV.<sup>154</sup> Their use of the concepts of internal and external time can be understood better in the immediate context of Suárez's metaphysics and the *Categories* commentary tradition but also, as it will become apparent, in terms of the new philosophical work done by this approach to time and the soul.

#### *Internal and External Time in the Textbook Tradition: France*

The theory of internal and external time was not unique to the Protestant tradition. It also appeared in French textbooks of natural philosophy, beginning in 1609 with the *Summa Philosophiae Quadripartita* of Eustachius a Sancto Paulo (1573–1640), who was a member of the Feuillant religious order and a Professor at the Sorbonne in the early seventeenth century. The fact that many of the other concepts related to internal and external time in the central European Protestant textbooks, such as imaginary time and the identification of time with duration, also appeared in the French tradition might indicate the dependence of the later French scholastics on the Germans, although this seems unlikely. The influence of Suárez on their work is also less well documented than with authors such as Timpler.

Roger Ariew argues that Eustachius and other seventeenth-century French scholastics associated with the University of Paris adopted a view of time that derived from a broader philosophical commitment to Scotism, and which was opposed to the Thomism of many Jesuit authors.<sup>155</sup>

<sup>152</sup> Wollgast, *Philosophie in Deutschland*, 190–1; Howard Hotson, *Johann Heinrich Alsted*, 15–17.

<sup>153</sup> Cees Leijenhorst, "Place, Space and Matter in Calvinist Physics," *The Monist* 84 (2001): 520–541.

<sup>154</sup> Petrus Ramus, *Scholae in liberales artes* (Hildesheim: Georg Olms Verlag, 1970), 732, also Sarah Hutton, "Some Renaissance Critiques of Aristotle's Theory of Time," *Annals of Science* 34 (1977): 354.

<sup>155</sup> Roger Ariew, *Descartes and the Last Scholastics* (Ithaca: Cornell University Press, 1999), 53; *Idem*, "Scotists, Scotists Everywhere," *Intellectual News* 8 (2000): 14–21, see also *Idem*, "Descartes and the Jesuits: Doubt, Novelty and the Eucharist," in *Jesuit Science and the Republic of Letters*, ed. Mordechai Feingold (Cambridge: MIT Press, 2003), 157–194.

He identifies the Scotist position on time as a form of moderate Augustinianism, noting that Scotus believed that time can exist without motion, since in the absence of heavenly motion it would measure the universal rest. Ariew finds a version of this argument in Eustachius and several other French scholastics, all of whom based their discussion of time on the distinction between internal and external time. His broader polemical aim here is to demonstrate that, together with a number of other theses about being, motion and place, the Scotist position about time, which he effectively elides with the internal-external time distinction, is a vital context for reading Descartes' philosophy.

In some respects, Ariew's argument seems plausible. Certainly, the French authors he discusses agreed that time is not necessarily dependent on motion, which was a recognisably Scotist position. But Scotus' treatment of time was fragmentary and spread amongst several different texts.<sup>156</sup> It was not presented as a philosophical account of the problem, but instead occurred within his treatment of primarily theological questions.<sup>157</sup> All attempts to reconstruct Scotus' discussion of time are thus at least partly synthetic in character, and must also recognize the opaque nature of his account. As Ariew points out, the most important feature of this theory was Scotus's argument, echoing that of Augustine, that time can exist without motion. Whilst Scotus never denied that time is the actual measure of celestial motion, he argued that if this motion ceased, time understood as the potential measure of motion would still exist.<sup>158</sup> Scotus argued that bodies in a state of absolute rest (such as those of the blessed in heaven) can be measured by potential time. Although they still exist in time, without motion we cannot say that they are in actual or real time.<sup>159</sup> Potential time can also measure bodies that move in the absence of heavenly motion. For Scotus, as for Augustine, Joshua's battle, and the fact that St. Peter will walk in time after the resurrection, provided evidence of this time in the absence of motion.<sup>160</sup> Scotus' discussion of potential time was nevertheless largely speculative, and essentially he seems to have supported the Aristotelian definition. Moreover, he had little to say about time and the soul.

<sup>156</sup> See N. Lewis, "Space and Time," in *The Cambridge Companion to Duns Scotus*, ed. Thomas Williams (Cambridge: Cambridge University Press, 2003), 69–99.

<sup>157</sup> Olivier Boulnois, "Du Temps Cosmique à la Durée Ontologique? Duns Scot, le Temps, l'Aevum et l'Eternité," in *Medieval Concept of Time*, ed. Porro, 161.

<sup>158</sup> Lewis, "Space and Time," 90–1.

<sup>159</sup> Boulnois, "Du Temps Cosmique," 171; Lewis, "Space and Time," 92.

<sup>160</sup> Lewis, "Space and Time," 92.

However, it is less clear whether the distinction between internal and external time, which was in fact the most prominent common feature of these French authors' treatment of time, was a genuinely Scotist position. There is some support for this notion in Scotus' works. His discussion of angelic duration or *aevum* contained some of the elements of the internal-external discourse. For example, he attempted to determine whether *aevum* was an intrinsic or extrinsic measure of the existence of angels and separated souls.<sup>161</sup> In the same discussion, he also referred to the mental operation involved in measuring this duration as that of imagination.<sup>162</sup> Whilst in some respects these elements appear to resemble the textbook accounts I have discussed, it is important to remember that Scotus' argument involved *aevum*, form of duration that was always understood as different from time. Citing him as the source of the distinction between the internal and external aspects of duration and time found in Suárez and the later textbook authors is therefore problematic. Although it is now established that Suárez drew on Scotist positions in his metaphysics, it seems more plausible that both his later discussion of *Quando* and Scotus' original account of angelic duration drew on a common scholastic language of intrinsic and extrinsic denomination than that Scotus alone influenced all of the later authors discussing this topic.

Certainly, though, it is true that some later authors writing avowedly Scotist philosophy courses in the mid- to late-seventeenth century applied the distinction between the internal and external elements of duration to the duration of created bodies (*tempus*) in the same way as the textbook authors. For example, the distinction between internal and external time was also found in several Scotist textbooks and courses from the mid-seventeenth century, such as those of Johannes Poncius (c.1591–1661) and the influential collaborative textbook of the Italian Franciscans Bartholomaeus Mastrius (1602–1673) and Bonaventure Belluti (1599–1676), which was written during the 1640s but not published until 1678.<sup>163</sup> These

<sup>161</sup> Etienne Gilson, *Jean Duns Scot: Introduction à Ses Positions Fondamentales* (Paris: Vrin, 1952), 403.

<sup>162</sup> Gilson, *Jean Duns Scot*, 403.

<sup>163</sup> On Mastrius and Belluti, see Marco Forlivesi, "Scotistarum princeps". *Bartolomeo Mastri (1602–1673) e il suo tempo* (Padua: Centro Studi Antoniani, 2002); also Marco Forlivesi, ed., "Rem in seipse cernere". *Saggi sul pensiero filosofico di Bartolomeo Mastri (1602–1673). Atti del Convegno di studi sul pensiero filosofico di Bartolomeo Mastri da Meldola (1602–1673), Meldola—Bertinoro, 20–22 settembre 2002* (Padua: Il Poligrafo, 2006); Bonaventure Crowley, "The Life and Works of Bartholomew Mastrius, O.F.M. Conv. 1602–1673," *Franciscan Studies* 8 (1948): 97–152 and Lynn Thorndike, *The History of Magic and Experimental Science* (8 vols., New York: Columbia University Press, 1923–1958), vol. VII, 465–6.

philosophy courses were connected to a more general revival of Scotism in France and Italy in the early to mid-seventeenth century, which coincided with the foundation of Scotist chairs and colleges in Paris and Rome, and the publication in 1639 of a new edition of Scotus' works edited by Luke Wadding, Poncius and Hugo Cavellus.<sup>164</sup>

In Johannes Poncius' *Philosophiae ad Mentem Scoti Cursus Integer* (first published 1642–5) time is treated as a species of duration, which should be considered in a twofold way: “one intrinsic, the other extrinsic. Intrinsic time is the duration of successive things, such as the duration of local motion, by which something transfers itself from one place to another. For just as *aevum*, and eternity are the intrinsic duration of permanent things, intrinsic time is the duration of successive things.”<sup>165</sup> Extrinsic time, Poncius noted, “is the number of motion according to former and latter, just as is commonly explained, that is, because it is created to make clear and certain to us the intrinsic duration of motion, so that by the order of coexistence of motion to that duration we can know how long motion endures and which motion has lasted longer than another.”<sup>166</sup>

Mastrius and Belluti's compendious *Philosophiae ad Mentem Scoti Cursus Integer* presented a comparable division between intrinsic and extrinsic time. They claimed that “time is twofold, intrinsic and extrinsic: the first is the successive duration particular to any motion... the second is the duration of something successive, in which other motions operate, and coexist with it, for which reason it is called the measure of motion.”<sup>167</sup> It should be noted that, unlike Poncius, Mastrius and Belluti saw intrinsic

<sup>164</sup> Dominique De Caylus, “Merveilleux Epanouissement de l'Ecole Scotiste au XVII<sup>e</sup> Siècle,” *Etudes Franciscaines* 24 (1910), 5–21; Thorndike, *Magic and Experimental Science*, vol. VII, 465–7.

<sup>165</sup> Johannes Poncius, *Philosophiae ad mentem Scoti cursus integer* (Lyon: Sumptibus Laurentii Anisson, 1672), 567: “Duplex considerari solet ab authoribus Tempus; unum intrinsecum, alterum extrinsecum. Tempus intrinsecum est duratio rerum successivarum, ut duratio motus localis, quo quis ab uno loco ad alium locum se conferret: quemadmodum enim aevum, & aeternitas est intrinseca duratio rerum permanentium, ita tempus intrinsecum est duratio rerum successivarum.”

<sup>166</sup> *Ibid.*, 567: “Tempus extrinsecum est numerus motus secundum prius, & posterius, prout communiter explicatur, id est, quod est aptum natum declarare, & certificare nos de duratione intrinseca motus, ita ut per ordinem coexistentiae motus ad illud possimus scire, quandiu duravit motus & quinam motus alio diutius duraverit.”

<sup>167</sup> Bartholomaeus Mastrius & Bonaventura Belluti, *Philosophiae ad mentem Scoti cursus integer* (Venice: Apud Nicolaum Pezzana, 1727), 341: “Hoc igitur tempus est duplex, intrinsecum, & extrinsecum; primum est propria cuiuslibet motus successiva duratio, de quo Scot. 2. dist. 2. quaest. 1.2..3. & 4 saepe loquitur; secundum est duratio alicuius successivi, in qua coeteri motus exercentur, ipsique coexistunt, qua ratione dicitur mensura motus...”

and extrinsic duration both as successive, and as connected to motion, not to being. This was a more conservative position than that of many contemporary textbook authors, and one that was in fact quite close to that of the Jesuit authors in its conception of time as an attribute of motion. Mastrius and Belluti identified extrinsic time with the familiar Aristotelian definition when they suggested that, unlike intrinsic time, it is a duration that relates to other motions, rather than merely to itself. With this move, of course, they made this aspect of time an extrinsic denomination. Mastrius and Belluti also distinguished between real and imaginary time, a division which they acknowledged came from Scotus' *Quodlibetical Questions*, but this distinction again rested on a connection between time and motion, not time and being. For Mastrius and Belluti, real time "is the real duration of some real motion, by which other motions are measured, of which kind is the motion of the first mover," whereas imaginary time "is the duration of some motion that is not actual, but possible, but nevertheless imagined by us in the manner of an actual, or positive motion."<sup>168</sup>

In the textbooks of early modern Scotists like Poncius, Mastrius and Belluti, the distinction between the internal and external aspects of time is presented as a thoroughly Scotist position. To prove its authentic lineage, these authors drew together numerous comments on time and angelic duration distributed amongst Scotus' various works. It is clear, though, that they interpreted these fragments using the language of intrinsic and extrinsic denomination established in the *Categories* commentary tradition, of which Suárez was the most important contemporary source. In many cases their language tracked his seamlessly. However, they also introduced arguments about the relationship between time and the soul from the Jesuit-Thomist tradition into their accounts. Poncius, for example, concluded that extrinsic time depends on the intellect insofar as it is distributed into "such or such parts, that is to say into hours, days, months and years."<sup>169</sup> Nevertheless, it is not a rational being, "because it has that denomination (i.e. its division into parts) from real acts of the intellect and will, without it being necessary to imagine or conceive something that is really impossible."<sup>170</sup> Thus although the conventional divisions of

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<sup>168</sup> *Ibid.*, 341: "...estque duplex, reale, & imaginarium, primum est duratio realis alicuius motus realis, qua coeteri motus mensurantur, qualis est motus primi mobilis..."; "...secundum, ut notat Doctor, quol.II.F. est duratio alicuius motus non actualis, sed possibilis, imaginati tamen ex nobis ad modum actualis, & positivi..."

<sup>169</sup> Poncius, *Philosophiae ad mentem Scoti*, 569.

<sup>170</sup> *Ibid.*, 569: "Ex quo etiam patet, quod quamvis tempus universale dependeret ab intellectu, quantum ad distributionem determinatam eius in tales vel tales partes, verbi gratia,

extrinsic time are partly mind-dependent, they are still aspects of real being because they are numbered by the intellect, or willed. Moreover, Poncius argued that neither the unreality of its parts nor its status as a successive duration make time unreal. These arguments are essentially similar to those advanced in the Thomist tradition. Mastrius and Belluti also used the concepts of real and rational being in their discussion of intrinsic time, arguing that "intrinsic time is something real, independent from the soul, since it is the existence of something really existing apart from an operation of the intellect."<sup>171</sup> Furthermore, because intrinsic time is the real existence or duration of a particular motion, and not the number or measure of that motion, it cannot be mind-dependent: the question of mind-dependence is more properly related to extrinsic time.<sup>172</sup> Their debt to the language and assumptions of the Jesuit-Thomist tradition was made explicit by their references to Pererius, Toletus, Rubius and the *Collegium Complutense*.<sup>173</sup> In a similar way to the Jesuit treatments of time previously discussed, Mastrius and Belluti suggested that time is neither wholly real nor wholly rational; extrinsic time relates indirectly to the motion of the heavens and the first mover, but it is divided conventionally by the mind.<sup>174</sup>

So, whilst these textbooks indicate that later Scotist authors considered the distinction between internal and external time to be an authentically Scotist position, the obscurity and relatively late publication dates of these works, and the ubiquity of the *Metaphysicarum disputationum tomus duo* throughout Europe in this period suggests that they, like the French authors mentioned by Ariew and the northern Europeans I have discussed, were ultimately most influenced by Suárez. Ariew therefore seems to have mistaken the true origin of these discussions. He also neglects

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in horas, dies, menses, annos, adhuc non diceret ens rationis, quia haberet illam denominatim ab actibus realibus intellectus ac voluntatis, absque eo, quod esset necessarium fingere, aut concipere aliquid realiter impossibile."

<sup>171</sup> Mastrius & Belluti, *Philosophiae ad mentem Scoti*, 342: "Secundo colligitur, quod tempus intrinsecum est aliquid reale ab anima independens, cum sit existentia alicujus realiter existentis absque opere intellectus..."

<sup>172</sup> *Ibid.*, 342: "...quaestio enim illa, an tempus ab anima formaliter dependeat, non debet proponi de intrinseco; sed de extrinseco tempore..."

<sup>173</sup> *Ibid.*, 342.

<sup>174</sup> *Ibid.*, 347: "Quapropter sensus huius definitionis est iste, tempus est mensura, non quidem a rebus avulsa, & solum in mente existens, sed mensurata, & in motu primi mobilis subiectata, potens mensurare alios motus, secundum successionem, & moram, vel quatenus est mensurata, & ab anima determinata inter duo indivisibilia, quorum unum est prius, alterum posterius."

the fact that, in using the distinction between internal and external time, seventeenth-century authors reformulated certain important Aristotelian assumptions about time and the soul. Ariew's argument about time is only one qualified part of a broader, and valuable, thesis about Scotism, but his treatment of internal and external time misses its broader context and its particular implications.

Some of these implications are evident in Eustachius a Sancto Paulo's *Summa philosophiae quadripartita*. The *Summa* was an influential text that was widely printed throughout Europe and, as we will see in Chapter Three, was read by Descartes and probably by Pierre Gassendi. Eustachius' manual summarized the views of various Parisian scholastic doctors associated with the Sorbonne in the early seventeenth century, and was an important source for many later French textbooks. In the section of the *Summa* dealing with physics, he argued that time is a kind of duration; the time that relates to natural bodies is "successive time, which comprises the successive and continuous operations of natural things."<sup>175</sup> Eustachius dissented from the Aristotelian definition, arguing that "time is called a number improperly and by analogy," a position also discussed by Keckermann.<sup>176</sup> He suggested instead that moving things are numberable because they have former and latter parts, or insofar as they have something past or future in them. Therefore we number time as if according to former and latter.<sup>177</sup>

Time, Eustachius argued, "is commonly assigned a twofold nature: one real and true, the other imaginary, wherefore it is this that we imagine to have preceded the creation of the world."<sup>178</sup> Imaginary time is the time in which we imagine God to have existed before Creation, and is truly imagined. External time, however, is "a kind of duration which is taken from outside to measure the duration of something; of this kind is the duration of an orbit or of celestial motion, inasmuch as it is taken to measure the

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<sup>175</sup> Eustachius a Sancto Paulo, *Summa philosophiae quadripartita, de rebus dialeticis, ethicas, physicis et metaphysicis* (Cambridge: Ex Officina Rogeri Danielis, 1649), 158: "...tempus successivum, quod operationibus rerum naturalium successivis & continuis competit."

<sup>176</sup> Sancto Paulo, *Summa philosophiae*, 158: "Tempus autem vocatur numerus improprie & analogice..."; Keckermann, *Operum omnium... tomus primus*, 1379: "Caeterum cum Philosophus tempus dicit numerum motus secundum prius & posterius, sumit vocabulum numeri analogice & per quandam translationem, ita ut numerus non significet ibi multitudinem ex unitatibus collectam, sed mensuram quae obtinet ordinem distinctionis secundum prius & posteriorius: quem ordinem vulgo Philosophi vocant numerum formalem."

<sup>177</sup> Sancto Paulo, *Summa philosophiae*, 158.

<sup>178</sup> *Ibid.*, 159: "Tempus vulgo duplex assignatur: aliud verum & reale: aliud imaginarium, quare illud est quod imaginatur praecessisse mundi creationem."

duration of sublunary things."<sup>179</sup> Internal time is "the duration particular and intrinsic to the motion itself; of this kind is the very duration itself of celestial motion with respect to the same celestial motions; and at the same time, it is the intrinsic duration of every change."<sup>180</sup> External time is clearly distinct from motion, because it is the measure of motion, whereas internal time is rather harder to distinguish. Internal time is formally distinct from motion, Eustachius suggested, because of the way in which we conceive of time:

For when we comprehend motion by means of the soul, we imagine some succession of some form that is successively produced or destroyed; but when we conceive of time, we imagine not motion, but the duration of motion, which is created from the successive flux of those parts.<sup>181</sup>

Our imagination, he argued, plays an important role not only in imaginary time, but also in the perception of real time, because we imagine duration when forming a concept of time. Further proof of the distinction between internal time and motion comes from the fact that "internal time is some natural affection of a moveable thing that is created from motion as if from its beginning; whence it is to be concluded that motion is, at least by its nature, prior to internal time."<sup>182</sup>

Eustachius attempted to reconcile his concept of time with the account in *Physics* IV by suggesting that Aristotle "defined external time, and that celestial time (inasmuch as it is first and most equal) insofar as it is applied to the measuring of the duration of sublunary things; for thus it is external."<sup>183</sup> He also tried to reconcile the concept of internal time

<sup>179</sup> *Ibid.*, 159: "Externum est duratio quaedam quae aliunde assumitur ad mensurandum cujuspiam rei durationem: cuiusmodi est duratio conversionum seu motum coelestium, quatenus assumitur ad mensurandum rerum sublunarium durationem."

<sup>180</sup> *Ibid.*, 159: "Internum vero est duratio cujusque rei propria & ipsi motui intrinseca; cuiusmodi est ipsamet duratio motum coelestium respectu eorundem motuum coelestium; simulque duratio intrinseca cujusque mutationis."

<sup>181</sup> *Ibid.*, 159: "Quia aliud concipimus dum motum concipimus, aliud vero dum tempus concipimus: Dum enim motum animo complectimur, successionem quandam imaginamus formae alicuius quae successively producitur aut deperditur; dum vero tempus concipimus, imaginamus non motum, sed ipsius motus durationem, quae ex successivo fluxu partium illius nascitur."

<sup>182</sup> *Ibid.*, 158: "Tempus illud internum naturalis est quaedam affectio rei mobilis quae ex motu nascitur tanquam ex suo principio; unde colligere est, motum natura saltem esse priorem tempore interno."

<sup>183</sup> *Ibid.*, 159: "Si quaeras hoc loco qualenam tempus definierit Aristoteles; respondeo, Definivisse tempus externum, illudque coeleste (utpote primum & aequabilissimum) quatenus applicatur ad mensurandas rerum sublunarium durationes: sic enim externum est."

with the Aristotelian model by arguing that “insofar as it is the proper and internal measure of celestial motion,” Aristotle’s definition might also apply to internal time.<sup>184</sup> Eustachius did not articulate the sources of his concept of internal and external time, although it is likely that he read Suárez. Certainly, his *Summa* was published well before the comprehensive Scotist philosophy courses of Poncius, Mastrius and Belluti. His concept of time was widely influential amongst French authors other than Descartes, and several French late scholastics wrote similar discussions of duration and time.

Amongst these was Charles d’Abra de Raconis (1580–1646), who taught philosophy in Paris at the Collège des Grassins and the Collège du Plessis, then became Professor of Theology at the Collège de Navarre, and published his *Totius Philosophiae Tractatio* in 1617.<sup>185</sup> D’Abra de Raconis referred to ‘intrinsic’ and ‘extrinsic’ rather than to internal or external time. Time for him is firstly the real duration of motion, which is neither fictional nor chimerical.<sup>186</sup> This duration is both intrinsic and extrinsic.<sup>187</sup> Intrinsic time is “that by which a thing is said formally to endure, and to remain in its own being. But extrinsic is that duration, by which a thing is said to endure for a [period of] time only through some extrinsic relation to another thing.”<sup>188</sup> In this way, two men born at the same time live for the same amount of measured external time. D’Abra de Raconis’ reference to an ‘extrinsic relation’ here recalls Suárez and the *Categories* commentary tradition, indicating that Eustachius was not the sole source of these ideas in France at this time. However, d’Abra de Raconis suggested that time can also be seen as the artificial duration created by the intellect from the motion of the first mover. The intellect divides celestial motion into its conventional parts, such as hours.<sup>189</sup> Time as it is divided into parts

<sup>184</sup> *Ibid.*, 159: “...licet quatenus est mensura propria & interna motus coelestis, sit vere tempus internum.”

<sup>185</sup> On d’Abra de Raconis, see Laurence Brockliss, *French Higher Education in the Seventeenth and Eighteenth Centuries: A Cultural History* (Oxford: Clarendon Press, 1987), 463; also Ariew, “Descartes and the Jesuits,” 164n42.

<sup>186</sup> Charles d’Abra de Raconis, *Totius philosophiae... tractatio* (Paris: Expensis D. de la Noüe, 1617), 360.

<sup>187</sup> *Ibid.*, 360: “Dicitur primo duratio, ubi notandum est durationem rei esse duplicem, intrinsecum, scilicet & extrinsecum.”

<sup>188</sup> *Ibid.*, 360: “Intrinseca ea est qua res formaliter durare, & in suo esse permanere dicitur. Extrinsica vero duratio ea est, qua per extrinsecam tantum relationem ad rem aliam aliquandiu durare dicitur...”

<sup>189</sup> *Ibid.*, 361: “Secundo modo tempus sumi potest pro illa artificiali duratione quae per intellectum certis quibusdam terminis circuncluditur, ad dimitrendas, explicandasque motuum durationes ut pro illa duratione motus primi mobilis, quatenus per intellectum

by the mind must therefore be a rational being. However, d'Abra de Racosni argued that this does not necessarily make time mind-dependent. For him, only external time involves dividing celestial motion into parts, and is subsumed under the definition, "Time is the number and measure of motion, according to former and latter," whereas internal time is real, not rational, and is defined as "Time is the successive duration of motion."<sup>190</sup>

A scantier discussion of internal and external time was found in the former Jesuit René de Ceriziers' *Le Philosophe François* (first published in 1643), one of a number of vernacular textbooks that appeared in the mid-seventeenth century, of which the historian Scipion Dupleix was the pioneer.<sup>191</sup> Ceriziers located his discussion within a critical survey of various ancient opinions concerning time, including that of Aristotle. Interestingly, he argued for a kind of mental time, suggesting that time "is a work of our intellect, since we take a separate quantity from a continuous quantity, naming it the number of motion, that is to say of the parts that we designate there."<sup>192</sup> Ceriziers also divided time into internal and external elements; internal time is "the duration of every thing or its permanence in Being: external time is the measure of this duration."<sup>193</sup> External time, however, equates directly to the motion of the first mover.<sup>194</sup> Ceriziers made no attempt to reconcile the idea of time as a "work of the intellect" and mental creation with its division into external and internal aspects. Like that of Alsted, his fragmentary and perhaps contradictory account echoed other contemporary discussions in a relatively unsophisticated way.

A more sophisticated account appeared in the royal counsellor and almoner Leonard de Marandé's *Abregé Curieux et Familiar de Toute la Philosophie* (1648). De Marandé argued that time "is nothing other than a

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dividitur in varias partes, nempe in viginti quatuor horas, ad dimitrendam cuiusque motus durationem, seu exporandum [sic] quandiu duraverit."

<sup>190</sup> *Ibid.*, 362.

<sup>191</sup> Scipion Dupleix, *Corps de Philosophie Contenant la Logique, la Physique, la Métaphysique et l'Ethique* (Rouen: Chez Manassez des Preaulx, 1626). Dupleix's discussion of time was more conventional, however. On Ceriziers, see Ariew, "Scotists, Scotists," 20.

<sup>192</sup> René de Ceriziers, *Le Philosophe François Tome I* (Paris: Chez Charles Argot, rue Saint Iacques, à la Ville de Leyden, 1658), 107: "Or il est certain que le temps est un ouvrage de nostre esprit, puis que d'une quantité continuë nous en saisons une séparée, la nommant nombre du Mouvement, c'est à dire des parties que nous y designons."

<sup>193</sup> *Ibid.*, 107: "Il y a deux sortes de Temps, l'Interieur est la durée de chaque chose ou sa permanence dans l'Estre; l'Exterior la mesure de cette durée."

<sup>194</sup> *Ibid.*, 107: "Et parce que ce qui sert de mesure doit estre connu, on prend le mouvement du premier Mobile pour le Temps, à raison de son uniformité & de la connaissance que le Soleil on donne par ses courses ordinaires."

duration, of which the successive parts are divided into before and after, that is to say that they are former and latter.”<sup>195</sup> He again divided time into ‘interior and exterior’, terms that, as in Eustachius’ *Summa*, paralleled his discussion of interior and exterior space. Interior time is “the duration, by which a natural being remains in its current and true existence, for such and for so long a time as it exists.”<sup>196</sup> The existence of a natural being, which is particular and internal to it, is its interior duration or time: a man’s life, he suggests, is his own internal duration.<sup>197</sup> Exterior time, on the other hand, “is properly the duration of the movement of the first mover, insofar as this movement or part thereof can be used to measure the duration of sublunary things.”<sup>198</sup> The time in which, or for which, a man lives is thus his own exterior time. Finally, de Marandé drew the familiar distinction between real and imaginary time. Real time is “that which we divide into past, and future, which can be measured by the motion of the first mover, and is calculated by its annual and daily revolutions.”<sup>199</sup> Interestingly, de Marandé seems to have identified real time only with exterior duration, rather than with the internal duration or life of a body. Imaginary time, on the other hand, in an echo of Eustachius, is “that which we imagine before the creation, in thinking back (*en retrogradant*) towards past eternity.”<sup>200</sup> De Marandé’s analysis resembled those of the other French textbook authors, although it was more coherent and detailed than that of Ceriziers.

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<sup>195</sup> Leonard De Marandé, *Abregé Curieux et Familiier de Toute la Philosophie Logique, Morale, Physique, & Metaphysique, & Des Matieres Plus Importantes de Theologien François* (Lyon: Antoine Cellier, 1648), 233: “Le temps, n'est autre chose qu'un durée, dont les parties successives se divisent par devant & apres, c'est à dire qu'elles sont precedentes & posterieures.”

<sup>196</sup> *Ibid.*, 234: “L’interieur est la durée, par laquelle un estre natural demeure en son existence actuelle & véritable, tant & si long temps qu'il subsiste . . .”

<sup>197</sup> *Ibid.*, 235.

<sup>198</sup> *Ibid.*, 234: “Le temps extérieur est proprement la durée du mouvement du premier mobile, entant que ce mouvement ou partie d’iceluy, peut estre employé pour mesurer la durée des choses sublunaires.”

<sup>199</sup> *Ibid.*, 235: “Le réel est celuy que nous divisons entre passé, & futur, qui peut estre mesuré par la durée du premier mobile, & supputé par ses revolutions annuelles & journalières.”

<sup>200</sup> *Ibid.*, 235–6: “Le temps imaginaire est celuy que nous nous figurons avant la creation, en retrogradant vers l’éternité antérieure.”

*Internal and External Time and the Soul*

Despite its innovative aspects, the theory of internal and external time found in these textbooks resembled the discussions in contemporary Jesuit commentaries and in the textbook tradition insofar as it still used the language of real and rational being to discuss the problem of time and the soul. However, although the discourse of internal and external time used the same language of real and rational being, it also rejected some of the central assumptions of the Thomist-Averroist theory of time adopted by Jesuit commentators and many other textbook authors. The accounts of internal and external time discussed here shared several important characteristics. They emphasized that time is a form of duration, and therefore began with the connection between time and being. These authors were concerned not so much with the status of time as a *kind* of being, as with the idea that individual bodies and souls exist and endure in their own particular times. This change of emphasis was accompanied by a new interpretation of the differences between real and imaginary time, and by a new concern with the interaction between time and mental faculties other than the intellect. The shift in focus away from the connections between time and the intellect stemmed partly from the tendency of these authors to consider time as a species of duration. As internal time was a “remaining in being” or the “duration through which a being remained in existence,” and not specifically the number or the measure of motion, it no longer depended on the intellect in its role as a numbering or measuring power. The concept of imaginary time adopted by authors such as Timpler and Eustachius typified this shift away from an intellect-based model of time. In contrast to the position upheld by most of the Jesuit commentators and textbook authors I have discussed, this notion of imaginary time allowed that an individual can actually *imagine* time. In the late Aristotelian language of real and rational being, this extra-cosmic, imagined time was a rational being, although not a fictional one.

A significant shift was also evident in the works of Calvinist authors such as Keckermann and Timpler towards discussing a conception of internal time in the context of human life and existence. This intriguing notion was not fully explored by either of these authors, but it raised the possibility that in animate bodies such as man, the soul itself, as an animating principle, could be identified with time. For, if internal time equated to the life of a body, then it might also equate to the soul that informs that body; this is a possibility that was highly significant for discussions of the soul in the contemporary *De Anima* tradition. Thus man’s

nature as a rational animal incorporated a distinct, and significant, temporal dimension. However, suggesting that the internal time of the human subject might describe the existence of its body and soul in some respects went against an important division in late Aristotelian metaphysics and psychology, which separated the successive duration of bodies and corporeal things from that of angels and rational souls. Most late Aristotelian authors distinguished between *aevum*, considered as the form of duration characteristic of the intellect or the rational part of the soul, amongst other things, and time, which applied to the body and the other corporeal aspects of the tripartite soul. In this model, an important part of the life of the rational human subject fell outside the category of time; in effect, the concept of time could not describe all the functions of the soul. A variation of this position occurred in Suárez's metaphysics; he argued that

Time is divided into corporeal and spiritual. And hence we have the origin of the primary division of continuous time, which theologians also use, for they divide time into material and spiritual. Material is this physical time, which is expended in bodily motions: but spiritual time is that which is found in the spiritual motions of angels.<sup>201</sup>

Suárez also noted that, although many commentators argued that the operations of the rational soul fell under the material aspect of time, it is clear that the intrinsic duration of the separated soul was spiritual, in the same way as its being.<sup>202</sup>

Suárez's most significant move in this discussion was to suggest that different *forms* of time might be able to describe both the corporeal and the incorporeal soul together. This was a position attacked by many authors, including, interestingly enough, Clemens Timpler. Timpler argued that, although his own view of time might seem to resemble that of Suárez, he in fact still held that the duration of incorporeal beings is "not time but

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<sup>201</sup> Suárez, *Metaphysicarum disputationum*, 472: "Tempus dividitur in corporeum, & spirituale. Et hinc ortum habuit primaria divisio temporis continui, qua etiam Theologi utuntur, dividunt enim tempus in materiale & spirituale: materiale est hoc Physicum, quod in corporalibus motibus consumitur: spirituale vero est quod invenitur in motibus spiritualibus angelorum."

<sup>202</sup> *Ibid.*, 472: "Nam licet multi contendant operationes intellectus & voluntatis animae coniunctae mensurari materiali tempore, propter concomitantiam & dependentiam aliquam a phantasmibus, de quo postea videbimus, tamen nemo probabiliter sentire potest, durationem intrinsecam horum actuum esse materiale tempus, cum ipsimet actus in se & in suo esse immateriales sint, & intrinseca duratio ab eorum esse non distinguatur: est ergo illa duratio immaterialis."

*aevum.*<sup>203</sup> However, Timpler's discussion of internal time nevertheless contained several elements that might suggest that he saw time as a concept that applied to the human subject as a union of body and soul. In particular, his references, also made by Keckermann, to internal time and the afterlife, and most importantly his division of internal time into 'physical and hyperphysical' elements suggest that he was moving towards a concept of time that could describe the existence of our whole being—that is, of the human subject as body and soul—in time. "Hyperphysical time," he argued, "is that which pertains to spiritual or incorporeal substances. Physical time is that which pertains to corporeal substances."<sup>204</sup> He thus seems to have argued that the category of internal time contained two kinds of duration that related to bodies and souls. It was perhaps because his discussion of internal time offered the possibility of thinking about a form of time that could describe the duration of the whole subject in this way that Timpler was so eager to affirm the orthodox nature of his position. The logic of Timpler's position was one implied in a number of other contemporary discussions of internal time and, although few authors in this period openly argued that one concept of time could describe the being and existence of the human subject, their works certainly supplied some of the resources for thinking about this question in a new way.

Overall, the discourse of internal and external time did some specific philosophical work within both metaphysics and natural philosophy. Firstly, it suggested a solution to what might be called the question of the unity of time, a problem stemming from the complex relationship between time and motion in Book IV of Aristotle's *Physics* IV. All Aristotelian authors needed to address the question of why—if time is the measure of motion—there cannot be as many times as there are individual motions, since many conceded that individual beings had a duration that was often only formally distinct from their existence. If this were the case, then it would be hard to talk of a unified concept of time *per se*, since this concept would only describe the 'numbers' of particular motions, which

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<sup>203</sup> Timpler, *Metaphysicae systema*, 65: "Etsi vero Franciscus Suarez disput 50 sect 7 videatur nobiscum consentire quando tempus aliud docet esse corporale aliud spirituale: tamen si mentem eius species reipsa dissentit. Tempus enim corporale tantum restringit ad motus corporales; sicut spirituale ad motus spirituales. Durationem vero substantiae incorporeae non vult esse tempus sed aevum. At cum haec opinio satis in superioribus quaestionibus fuerit refutata, non opus est diutius in illa refellenda commorari."

<sup>204</sup> *Ibid.*, 53: "Substantiale tempus est quod substantiis creatis inest. Estque vel hyperphysicum vel physicum. Hyperphysicum est quod proprium est substantiae spiritualis seu incorporeae. Physicum quod proprium est substantiae corporeae."

could not necessarily be reconciled with each other. Against the idea that time is based purely on particular motions—a move which would for most authors make time more obviously the subject of natural philosophy than of metaphysics—late Aristotelian commentators and textbook authors relied on the association with heavenly motion to provide a unitary notion of time that depended on *one* motion, not many. The division between internal and external time can be seen as an intervention into the issue of general and particular duration and time. It offered a way of conceptualizing the nature of time in terms both of the duration of particular beings (its internal element) and an external measure or conceptual framework through which to compare these particular durations (external time and the notion of an imaginary succession favoured by some authors).

The second, and more novel, work done by the theory of internal and external time, as I have suggested, concerned its implications for accounts of the soul and the human subject. Essentially, these authors offered an alternative solution to the problem of how time related to the soul that reconciled the mental and physical aspects of time: because time was composed of internal and external elements, they could assign the characteristics of *ens reale* and *ens rationis* to these distinct elements without having to argue that time was at once both real and rational. This was in many respects a neat solution to an ontological problem first raised in the Aristotelian formula from *Physics* IV—that time has both mind-dependent and mind-independent characteristics. These theories of internal and external time also developed an understanding of time that expanded the role played by the soul and connected the particular time of individual subjects more closely to the concept of being.

## CHAPTER TWO

### PSYCHOLOGY, THE SCIENCE OF THE SOUL

#### *Introduction*

Accounts of the connection between time and the soul in late sixteenth century metaphysics and natural philosophy mainly approached the question in terms of how the involvement of the soul, and specifically of the intellect, affected time's ontological status. However, as I argued in Chapter One, in the early seventeenth century many authors addressed the argument that individual beings possessed their own unique 'times', conceived of as the existence and endurance of body and soul. Related to this development was a move away from the identification of the intellect with time, and towards a broader conception of the involvement of other powers of the soul, such as the imagination. Thus whilst these authors examined the connections between time, being and the existence of the soul, they also diversified their account of the role played by the soul in the construction of time.

This approach still began with a concept of time structured around largely ontological concerns. However, this ontology of time, found in works on metaphysics and natural philosophy, was complemented within the *De Anima* commentary tradition by what I call a 'psychology of time'. The 'psychology of time' was a complex account of how the soul and its operations are structured by, and situated within, time. It applied and adapted the concepts of time and duration discussed in the previous chapter to accounts of the soul in a variety of ways. To an extent, this 'psychology of time' can be seen as part of a move away from an intellect-based model of time-perception. However, the accounts of the soul discussed here went beyond simply supplying a 'thicker' account of how the mind becomes aware of time, because they also considered how time and duration structure the operations of the soul. They considered not only how we think of time (that is, how we form a mental representation or concept of it), but also how we think, sense, remember and judge *in*, and *through*, time. I argue that late Aristotelian theories of the soul took time into account to a great extent, and that neglecting this fact has impoverished our understanding of their arguments. What emerges from reading

these accounts in the context of contemporary Aristotelian metaphysics and natural philosophy is an argument about the soul (both human and animal) existing, but also operating and orienting itself, in time. Whereas the textbooks of natural philosophy and metaphysics previously discussed connected time to being and existence, the early modern *De Anima* tradition presented an account of being and existence in time. In some respects, this argument implied a theory of the human subject orienting itself in time, and of man as a peculiarly temporal animal whose activities and potential can be understood only through the concept of time.

### *The Soul in Late Aristotelian Philosophy*

For late Aristotelian authors, psychology, or the science of the soul (*psychologia* or *scientia de anima*), was also part of natural philosophy. It involved the study of the soul as the animating principle of living organisms, through the text of Aristotle's *De Anima* and *Parva Naturalia*.<sup>1</sup> Psychology was commonly seen as the noblest aspect of natural philosophy, but also as a transitional science that opened the way to metaphysics, theology and medicine.<sup>2</sup> As late Aristotelians viewed the soul as the animating principle of living bodies, for them psychology necessarily involved the study of growth and reproduction, as much as of sense-perception and thought.<sup>3</sup> For this reason, it cannot simply be identified with the modern disciplines of psychology, philosophy of mind, or cognitive science.

Whilst the complexity of late Aristotelian psychology must be acknowledged, it is still possible to give a general overview of the structure of the soul in the early modern textbook and commentary tradition.<sup>4</sup> The soul was commonly distinguished into various faculties or powers. The vegetative

<sup>1</sup> On the development of 'psychology' as a concept in the sixteenth century, see Fernando Vidal, *Les sciences de l'âme XVI<sup>e</sup>-XVIII<sup>e</sup> siècle* (Paris: Honoré Champion, 2006); Francois H. Lapointe, "The Origin and Evolution of the Term 'Psychology,'" *Rivista Critica di Storia Della Filosofia* 28 (1973): 138–160; on the term *scientia de anima*, see Des Chene, *Life's Form*, 11–12.

<sup>2</sup> See Eckhart Kessler, "The Concept of Psychology," in *Cambridge History of Renaissance Philosophy*, 457 and Paul J.J.M. Bakker, "Natural Philosophy, Metaphysics, or Something in Between? Agostino Nifo, Pietro Pomponazzi, and Marcantonio Genua on the Nature and Place of the Science of the Soul," in P.J.J.M. Bakker and J.M.M.H. Thijssen, eds., *Mind, Cognition and Representation: The Tradition of Commentaries on Aristotle's 'De anima'* (Aldershot, 2007), 151–177.

<sup>3</sup> Des Chene, *Life's Form*, 1–2.

<sup>4</sup> My account here is indebted to Katharine Park, "The Organic Soul," in *Cambridge History of Renaissance Philosophy*, 471.

soul, which included the powers of growth, nutrition and generation, was common to plants, animals and man. The sensitive soul, which included the powers of locomotion, appetite and desire, perception, cognition and memory, and also the internal and external senses, was found in both animals and man. The five external senses (vision, hearing, smell, taste and touch), received intentional species (or forms abstracted from matter) from present external objects through a medium. The internal senses varied in number according to different authors, but included *phantasia*, imagination, memory, estimation and common sense. Like many other aspects of late Aristotelian psychology, the notion of the internal senses as a distinct type of mental faculty did not feature in *De Anima* or *Parva Naturalia*, but instead originated in the medieval Latin and Arabic traditions.<sup>5</sup> There was considerable debate in late Aristotelian commentaries about their provenance, number, and value. Some authors reduced the various internal senses to a single power, or sought to eliminate them entirely. All the internal senses dealt with images of absent objects. The common sense (*sensus communis*) acted as a 'clearing house', comparing impressions received from the external senses and transmitting them to the imagination. It was also believed by many authors to perceive the six common sensibles (motion, rest, shape, magnitude, number and unity) which related to more than one external sense. *Phantasia* produced new images of the now-absent objects of sensation (*phantasmata*), which were then transmitted to the intellect or to the sensitive memory, which conserved them. For many authors, imagination differed from *phantasia* either because it temporarily stored sense-impressions before they were transmitted to the other internal senses, or because it 'imagined' invented images of absent objects. Sensitive memory stored sense-impressions and *phantasmata*. The final internal sense discussed by many authors, estimation (or *aestimativa*), was the ability of animals to recognize and react to a friendly or unfriendly object. The sheep avoids the wolf, for example, because it exercises estimation. The instinctive reactions of estimation were also preserved by the sensitive memory.

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<sup>5</sup> See Henrik Lagerlund, ed., *Forming the Mind: The Internal Senses and the Mind/Body Problem from Avicenna to the Medical Enlightenment* (Dordrecht: Springer, 2007); Juhana Toivanen, "Peter Olivi on Internal Senses," *British Journal for the History of Philosophy* 15:3 (2007): 427–454; E. Ruth Harvey, *The Inward Wits: Psychological Theory in the Middle Ages and the Renaissance* (London: Warburg Institute, 1975) and Harry A. Wolfson, "The Internal Senses in Latin, Arabic and Hebrew Philosophic Texts," *Harvard Theological Review* 28 (1935): 69–133.

The noblest and most important part of the soul was the rational power or intellect, which encompassed the active and passive intellects (*intellectus agens* and *intellectus passivus*, *intellectus possibilis* or *intellectus patibilis*), the rational appetite or will, and the intellectual memory, which was often identified with the passive intellect and which preserved universal mental concepts. The active and passive intellects were seen not as distinct powers of the soul, but rather as different forms or modes of the same power. The intellect was unique to humans, and was commonly seen as man's defining characteristic. For most authors, the intellect was incorporeal, eternal, and survived the death of the body and the extinction of the soul's corporeal aspects, the sensitive and vegetative powers. Its eternal duration was measured by *aevum*, rather than by time, which described the duration of the sensitive and vegetative faculties. The nature and operation of the intellect was unsurprisingly one of the most complex and controversial topics in late Aristotelian psychology. The primary act of intellection occurred as the active intellect (*intellectus agens*) illuminated a phantasm supplied by *phantasia*, and thereby abstracted it from material conditions such as time and place, producing an intelligible form or *species* that was received by the passive intellect in a process analogous to sense-perception. The process of intellection produced a universal mental concept (*species expressa*) from an 'impressed species', or *species impressa*, which was a contingent perception of a singular object. Mental concepts related to spoken language in a complex manner. Secondary acts of intellection, such as composition and division, followed the primary act of illumination and reception.

A characteristic feature of the late Aristotelian *De Anima* commentary tradition was the expansion of its terms of reference to include material from other areas of natural philosophy, and from medicine. This was especially evident in works that discussed the structure and operation of the body, as well as of the soul. In this respect, learned medicine, and particularly the study of anatomy, was an important influence on many late Aristotelian authors. Medieval authors had not entirely neglected this aspect of *De Anima*, but in the sixteenth century particularly detailed discussions of the organs and structures of the human body, and of how they related to the powers of the soul, developed in northern European textbooks such as that of Philip Melanchthon, as part of a Lutheran theology of the resurrection of the whole body.<sup>6</sup> The increasing role played by

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<sup>6</sup> See Sachiko Kusukawa, *The Transformation of Natural Philosophy: The Case of Philip Melanchthon* (Cambridge: Cambridge University Press, 1995), 75–123.

anatomy and medical knowledge is evident in the work of other Protestant authors such as Otto Casmann, whose *De Anima* textbook *Psychologia Anthropologica* (1594) had a companion volume concerning “the fabric of the human body”, but also in the Jesuit tradition, and in commentaries written by physicians such as Simon Simonius.<sup>7</sup> This preoccupation is particularly relevant to the role of duration in accounts of the soul.

### *Time and Duration in the De Anima Tradition*

This chapter will show that the concepts of time and duration found in commentaries on the *Physics* and in textbooks of natural philosophy and metaphysics also played an important role in the *De Anima* commentary tradition. I argue that many late Aristotelian authors used elements of this language of duration and time to describe and analyze the functions and operations of the soul. Consequently, their commentaries discussed not only how the soul—as the substantial form of the body—exists in time, but also how time itself affects the soul. However, their use of this language was not always consistent with the concerns evident in contemporary natural philosophy and metaphysics.

The potential for drawing connections between the terminology of time and duration in natural philosophy and in metaphysics was made particularly explicit in the work of the Jesuit commentator Hieronymus Dandinus (1554–1634). Dandinus’ *De corpore animato* (1610) discussed the concept of duration in a long digression (*Digressio... de rerum duratione*) inserted after the section on temperaments within the vegetative and sensitive souls.<sup>8</sup> Although in some respects (such as the structure of his work and its eclectic tone) Dandinus was an untypical Jesuit Aristotelian, his *De Anima* commentary showed many of the themes discussed here

<sup>7</sup> See Otto Casmann, *Secunda pars anthropologiae, hoc est fabrica humani corporis* (Hanoviæ: Apud Guilielmum Antonium, impensis Petri Fischeri, 1596); Hieronymus Dandinus, *De corpore animato libri VII, luculentus in Aristotelis tres De Anima libros, commentarius peripateticus* (Paris: Apud Claudium Chappleatum, 1610); Simon Simonius, *In liber Aristotelis... hoc est de sensum instrumentis & de his quae sub sensum cadunt, commentarius unus eiusdem in librum Aristotelis... hoc est De Memoria & Reminiscentia, commentarius alter* (Geneva: Apud I. Crispinum, 1566); Jean Fernel, *The Physiologia of Jean Fernel* (Philadelphia: The American Philosophical Society, 2003); Katharine Park, “The Organic Soul,” 482–3; Michael Edwards, “Body, Soul and Anatomy in Late Aristotelian Psychology,” in *Form and Matter in Early Modern Philosophy*, ed. Gideon Manning (Brill: Leiden, 2012), 33–75.

<sup>8</sup> Dandinus, *De corpore animato*, 942: “Locus monet ut & universe de rerum omnium duratione dicamus, in specie namque de viventium vita satis in libro de illorum temperatione dictum est.”

in a very clear way.<sup>9</sup> His digression placed the question of time within a framework familiar from discussions in contemporary Aristotelian metaphysics and natural philosophy, since it examined duration as it relates to essence and existence. However, Dandinus was not concerned with the ontology of time in the same way as the textbook authors and commentators discussed in the previous chapter. Firstly, he argued that essence and existence differ only in that existence is the mode of essence.<sup>10</sup> Finite, created essence is divisible into various categories of greater and lesser perfection, which equate to magnitudes. Existence, on the other hand, also has its own magnitude, which is a kind of remaining in being. Duration, therefore, is nothing other than the “remaining or the actual being of existence.”<sup>11</sup> But, since existence follows essence, duration must also follow the magnitude of essence, which means that different durations exist just as different essences do.<sup>12</sup> Therefore, just as there are three kinds of essence, there are three forms of duration. Dandinus followed the typical division of duration into eternity, *aevum*, and time:

Hence three durations exist. One is infinite, independent, lacking a beginning and an end, and particular only to God. This is eternity. The other is finite, dependent, having a beginning but lacking an end, and is of the intelligent and remaining immortal beings. This is *aevum*. The third, which also has an end, is common to all those that are created and suffer death. This is time.<sup>13</sup>

Eternity and *aevum* are indivisible, invariable and without succession. Time, on the other hand, follows motion and involves both succession and variation: “The other [form of duration] has both succession and variation:

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<sup>9</sup> For a detailed discussion, see Michael Edwards, “Digressing with Aristotle: Hieronymus Dandinus’ *De corpore animato* (1610) and the Expansion of Late Aristotelian Philosophy,” *Early Science and Medicine* 13 (2008): 127–70.

<sup>10</sup> Dandinus, *De corpore animato*, 942: “Existentia nec Entitatem nec perfectionem ab essentia distinctam, sed illius modum.”

<sup>11</sup> *Ibid.*, 942: “Habet tamen existentia quoque magnitudinem suam; quae in eo versatur, ut illud esse actu, quod ea significat, non statim atque habetur cессет, sed permaneat. Atque haec est duratio, permanentia scilicet rei inesse actu existentiae.”

<sup>12</sup> *Ibid.*, 942: “At quoniam existentia essentiam sequitur, duratio magnitudinem essentiae comitatur: & quemadmodum diverse sunt essentiae, sic aliae atque aliae durationes existunt.”

<sup>13</sup> *Ibid.*, 942: “Hinc triplex existit duratio. Infinita una, independens, principio carens & fine, solius Dei propria, Aeternitas, Altera finita, dependens, principium habens, sed carens fine, intelligentiarum & reliquorum Entium immortalium; Aevum. Tertia, quae finem etiam habet, omnibus iis, quae giguunt & occidunt, communis, tempus.”

this is undoubtedly time, which follows motion, by which mortal things are continually agitated and flow. And thus it is defined as the number of motion according to former and latter; this is the variable measure and succession of motion.”<sup>14</sup>

This model of duration and time closely resembled that found in contemporary *Physics* commentaries and natural philosophy textbooks, and specifically those works that described time’s connection with *being*. Dandinus followed Suárez in arguing that, fundamentally, essence and existence are only formally distinct. Therefore essence, existence and duration, which is simply a remaining in existence, are also identical.<sup>15</sup> This means that the various forms of duration are also only formally distinct from things that endure.<sup>16</sup> Dandinus argued that, since essence and existence are not really distinct, duration is also separable from the enduring thing only in the mind of God.<sup>17</sup> However, he also went further than many late Aristotelian authors in eliding time with motion, arguing that “motion, and time in things that are born and perish, are the same thing, and only differ in form.”<sup>18</sup> In some respects, his argument resembled that of Keckermann, in that he equated time and internal motion with life and existence. However, Dandinus conceded that motion is by nature prior to time and that our awareness of time is mediated by heavenly motion, unlike that of eternity and *aevum*, which is less clear and harder to achieve.

In some respects, what Dandinus offered was a relatively familiar account of duration and time that drew on assumptions from contemporary metaphysics and natural philosophy. Perhaps the most interesting question in this regard is its presence in a commentary on Aristotle’s

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<sup>14</sup> *Ibid.*, 942: “Alia, quae & successionem habeat & variationem: Tempus nimirum, quod sequitur motum, quo res mortales continenter agitantur & fluunt. Et ideo definitur Numerus motus secundum prius & posterius: hoc est variabilis mensura & successio motus.”

<sup>15</sup> *Ibid.*, 942: “Sed quoniam essentia quoque & existentia sunt idem re, sit ut essentia, existentia, & duratio, ita sint idem, ut non nisi formaliter in rebus creatis, in Deo sola mentis nostrae actione distinguantur.”

<sup>16</sup> *Ibid.*, 942: “Aeternitas re est ipsemet Deus absque principio & sine independenter durans: Aevum res ipsa aeterna: tempus res temporanea in suo esse perseverans.”

<sup>17</sup> *Ibid.*, 942: “Dum vero essentia & existentia in rebus creatis formaliter distinguntur, sit ut duratio quoque, quae in existentia consideratur, an ea re, quae durat, formaliter differat: in Deo sola mentis nostrae cogitatione. Propterea quod alia non est in eo essentiae & existentiae distinctio.”

<sup>18</sup> *Ibid.*, 943: “Motus quoque & tempus in rebus, quae oriuntur & pereunt, sunt idem re, solaque differunt forma.”

*De anima*. Dandinus' commentary technique presumed that the material included in his digressions related ultimately to Aristotle's text, so he clearly intended to bring this material into direct dialogue with *De anima*.

Dandinus' digression attempted to put accounts of time from the *Physics* commentary tradition into dialogue with aspects of late Aristotelian psychology, not only by presenting time and duration as topics relevant to discussions of the soul, but also by connecting an understanding of duration as it relates to the existence of beings in time to theories of the soul. In doing so, it illustrates the viability of connecting concepts of time and duration and theories of the soul for late Aristotelian authors. In particular, it shows that the view of time as a concept relating to being and existence common in early seventeenth-century natural philosophy and metaphysics could readily be extended to accounts of the soul. Thinking about time and being, it seems, also involved the soul. Dandinus' account of time and duration related them to the existence and essence of beings, but was less concerned than other contemporary accounts with questions of ontology.

Dandinus' digression on duration indicated how the language of time and duration might be connected to psychology in general terms, but it did not offer specific instances of how this productive connection might occur. I want to sketch out some of these here. Although Dandinus mentioned Aristotle's formal definition of time as the "number of motion according to former and latter," this notion of time played a relatively minor role in contemporary discussions of the soul. This can be explained partly by the focus of these discussions, which, as I have emphasized, was on the role of time in the structure and functions of the soul, and not on the contribution of the soul to the ontology of time. Although the intellect as a numbering faculty was an important starting point for late Aristotelian discussions of the ontology of time, this formulation was largely absent from the *De Anima* commentary tradition. Its place was taken by the notion of temporal sequence. The concept of sequence was central to most Aristotelian accounts of the soul, because these accounts involved corporeal and incorporeal operations that either followed each other, or operated concurrently: this point was particularly evident in accounts of sensation and intellection. However, the existence of sequence in the soul did not necessarily imply a *temporal* sequence, or one modelled explicitly on the notion of 'before and after' from *Physics* IV. A division was evident here between accounts of the formation of the soul and its operation. Certainly, growing early modern interest in embryology and the genesis of

the soul led to speculation about the temporal order in which its various parts developed after conception.<sup>19</sup> But this speculation about time and the development of the soul was not echoed universally in accounts of its operation. For although Aristotle himself suggested that the transition between potential and action (a central concept in his psychology) can occur as a sequence in time, late Aristotelian metaphysics offered several different ways of thinking about both action and sequence. The fact that mental operations in Aristotelian psychology were not explained in terms of mental motion was important here, because if thought and cognition do not involve motion, then they do not have to involve time. There is a sense in which these mental operations may *exist* in time, or endure for a period of time, but this argument was not adopted consistently. Moreover, the fact that some aspects of the soul's operation last for a certain period of time did not imply that, for example, the progression from sense-perception to the formation of intelligible species occurs in time. Ultimately, the idea that mental processes such as sense and intellection are structured around a temporal sequence was a problematic issue for these authors. This difficulty stemmed from the related assumptions that the intellect had no direct connection to singulars in the temporal world, and that its duration was distinct from time. However, I argue that problems with the notion of temporal sequence in the soul forced these authors to consider ways in which the human souls might sense and think *in time*.

Related to this question was a distinction between temporality and atemporality in the soul. This dichotomy, emphasized by almost all of these authors, was perhaps the best-known distinction in Aristotelian psychology. The temporal functions of the soul were those that both existed in time and engaged with objects in time, that is, with objects that have a beginning and an end and are subject to change. They were functions of the vegetative and sensitive souls, and particularly of the internal and external senses. The atemporal aspect of the soul, which was eternal and abstracted from temporal things, was the intellect. This distinction, which separated the highest functions of the soul from temporality, might be seen as diminishing the role of time in Aristotelian accounts of the soul. In some respects, it also seems to contradict the argument in

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<sup>19</sup> See e.g. Arriaga, *Cursus philosophicus*, 630–1 ('Quo tempore producatur Animus') and 632–3 ('An praecedant aliae Animae in corpore ante rationalem'). On early modern embryology, see Vivian Nutton, "Anatomy of the Soul in Early Renaissance Medicine," in *The Human Embryo: Aristotle and the Arabic and European Traditions*, ed. Gordon R. Dunstan (Exeter: Exeter University Press, 1990), 136–57.

*Physics* IV that the intellect is central to the being of time. However, the association between the intellect and atemporality was less straightforward than it seems, and some late Aristotelian authors refigured the relationship between time and the intellect in a series of related debates.

Duration, as the continuation in existence of being, was discussed less extensively than time. It figured in late Aristotelian psychology because these authors treated the soul as the animating principle of living bodies. The duration of a living body, its life and its soul were therefore closely entwined. This was particularly evident in accounts of the vegetative faculty of the soul, which sustained life through the processes of respiration, nutrition and generation. Hieronymus Dandinus, for example, argued elsewhere in his *De Corpore Animato* that “we call life the remaining of the soul in the body,” or the remaining of heat in the nutritive part of the soul.<sup>20</sup> However, in this case Dandinus made it clear here that he did not wish for life “to be understood formally as duration, which signifies time, but materially as the soul itself remaining and enduring in the body, and giving it being, or formally as the existence or formal effect of the existing soul in the body.”<sup>21</sup> It appears that Dandinus drew on more than one notion of duration in this digression and elsewhere in his treatise. The ‘formal effect’ that the soul gives to the body is life, and whilst the soul and body are joined, the body is alive. Dandinus connected this notion of duration as the remaining in existence of a conjoined body and soul to the concept of time by arguing that “This formal effect is formally life, and the enduring of existence is duration, that insofar as it is connected with succession, mutation, variation and divisibility into former and latter, is the time by which the life of every living thing is measured.”<sup>22</sup> The life of a body is its duration in existence, but when it is thought of in terms of change, duration becomes the time by which the sensitive and vegetative souls are measured, or for which they endure. There are strong similarities between Dandinus’ argument here and the concept of internal time explored in the textbook tradition, and particularly with the work of Keckermann. But, as I have suggested, the notion that the intellect

<sup>20</sup> Dandinus, *De corpore animato*, 73: “Sed cum vitam dicimus esse animae permanitionem in corpore . . .”

<sup>21</sup> *Ibid.*, 73: “Nolo quemquam intelligere durationem formaliter, quae tempus significat, sed materialiter animam ipsam permanentem & durantem in corpore, & illi dantem esse: formaliter autem existentiam seu potius formalem animae in corpore existentis effectū.”

<sup>22</sup> *Ibid.*, 73–4: “Hicque effectus formalis est formaliter vita; existentiaeque mora est duratio, quae quatenus est cum successione, mutatione, varietate, & prioris ac posterioris partibilitate, tempus est, quo viventis cuiusque vita mensuratur.”

endured in time was still problematic for most late Aristotelian authors because of its association with *aevum*.

As Dandinus' commentary shows, concepts of time and duration from contemporary natural philosophy and metaphysics were not always transferred in an uncomplicated and consistent manner to discussions of the soul. Nevertheless, they were an important influence on those discussions. In the remainder of this chapter, I will discuss how these concepts functioned within accounts of the intellectual and sensitive powers of the soul, and explain their wider significance for our understanding of late Aristotelian psychology. The discussion begins with the higher powers of the soul—the intellectual powers, which in many respects raised some of the most challenging questions for late Aristotelian commentators.

### *Time and the Intellect*

As we have seen in Chapter One, the relationship between time and the intellect was a key issue in the *Physics* commentary tradition. However, although *Physics* IV connected the intellect as a numbering power with time, many of the commentaries and textbooks discussed in the previous chapter were distinguished by a common shift away from identifying the intellect as the chief mental faculty involved in our awareness of time. In the *De Anima* commentary tradition, time still played a central role in discussions of the intellect. The concept of time was at the centre of a complex range of issues surrounding the intellect, which ultimately stemmed from common assumptions within the late Aristotelian tradition about its atemporal nature.

Ian Maclean has indicated suggestively that one of the strengths of late Aristotelian psychology is the attention that it paid to time in relation to thought.<sup>23</sup> I wish to go further than him by arguing that the accounts of the relationship between time and the intellect given by these authors represented an important and neglected part of their psychology that has implications for accounts of time and the human subject within early modern Aristotelianism more broadly. This relationship between time and the intellect was developed through discussions of several related issues: the connection between intellection and temporal sequence, the question of time, knowledge and self-knowledge, the question of whether

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<sup>23</sup> Maclean, "Language in the Mind," 299, 320.

the intellect always thinks, and the phenomenon of intellectual memory. Although these issues were discussed separately by most authors, they formed part of a broader approach to the question of how the ‘atemporal’ intellect related to time and duration. What connects these questions is an emphasis on the place of carefully articulated concepts of time within accounts of the powers of the rational soul. Thus these were not wholly disparate debates, but rather facets of a broader exploration of time’s place within the intellect, and of the intellect’s place in the temporal world.

The intellect represented a special case in Aristotelian psychology, because the rational faculties were the only parts of the soul that were unique to man. The human intellect was eternal, incorporeal and survived after the death of the body. The study of the intellect therefore involved the disciplines of metaphysics and theology as well as psychology. As the intellect was eternal, it was divorced from the temporal duration of the corporeal body and of the sensitive and vegetative souls, and was concerned with atemporal universals, rather than with the particulars of lived experience: as Aquinas argued, whilst sense knows beings according to “the here and now,” the intellect “apprehends being absolutely, and according to all time.”<sup>24</sup> Johannes Magirus argued that the rational soul is the measure of time, and not measured by time: for this reason, “it is above time, and does not sense the injuries of it.”<sup>25</sup> For the Coimbra commentator, this distinction was reflected in the circular structure of the intellect itself, which contrasted with the linear, temporal form of the senses.<sup>26</sup> The intellect’s orientation towards universals made it atemporal, and this orientation was achieved by the passive agent intellect abstracting all material

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<sup>24</sup> St. Thomas Aquinas, *Summa theologiae*, ed. and transl. the Dominican Fathers (61 vols. London: Blackfriars, 1964–1980), vol. IV, 30 (1a.q.75, a.6): “Sensus autem non cognoscit esse nisi sub hic et nunc, sed intellectus apprehendit esse absolute, et secundum omne tempus.”

<sup>25</sup> Johannes Magirus, *Physiologiae peripateticae libri sex cum commentariis* (Cambridge: Ex Officina R. Danielis, 1642), 390: “Ad haec, ea sola sunt caduca, quae sunt in tempore: ea autem dicuntur esse in tempore, quae tempus mensurant: atqui animus est mensura temporis, non tempus animi, ideoque est supra tempus, neque illius sentit injurias.”

<sup>26</sup> Collegium Conimbricense, *Commentarii Collegii Conimbricensis Societatis Iesu, in tres libros De Anima Aristotelis Stagiritae* (Cologne: Sumptibus Haeredum Lazari Zetzneri, 1629), cols. 409–10: “Docet vero animam humanam cognoscere quidem rem singularem, eamque sensibilem sensitiva potentia: universalem vero vel potentia separabili, id est diversa realiter, vel re quidem una, sed secundum rationem diversa: & quae se habeat ad seipsam ut linea inflexa ad semetipsam rectam. Sicut enim cum inflexa magnitudo in rectum porrigitur, eadem linea, quae antea flexa, seu curva erat, sit recta, neque tamen a se realiter, sed ratione tantum differt: ita fortassis (nec enim hic propositam controversiam ex toto dirimit) sese haberet facultas, qua universale, & qua singulare sensibile cognoscitur.”

conditions from the phantasmata with which it is presented. As Magirus argued, “universals are known...through abstraction of time, place and of other circumstances”; the active intellect abstracts the species of material things from “the externalities of place, time, figure, colour and other accidents, which do not concern the essence of the thing.”<sup>27</sup> Similarly, Franciscus Toletus noted that “the intellect acts by abstracting an object from place, time and present objects.”<sup>28</sup> Time for these purposes was numbered among the non-essential accidents of singular entities. The association made by these authors between time, particularity, and singularity meant that man, as a rational animal existing and enduring in time, must in a sense detach himself from time in order to exercise his rationality. An inherent tension between temporality and rationality was therefore at the heart of all late Aristotelian accounts of the intellect. This tension also informed accounts of the structure of the soul itself, because the enduring, temporal sensitive and vegetative powers of the soul were contrasted with the intellect. This contrast meant that the powers of the sensitive soul, such as perception, cognition and sensitive memory, were distinguished from intellection not only by their nature and operation, but also by time.

In some respects, it could be argued that late Aristotelian psychology supported two conflicting models of the relationship between mental operations and time. However, whilst the intellect dealt with universals abstracted from the material conditions of time and place, it was not wholly atemporal in the sense of having no relation whatsoever to time. Late Aristotelian authors argued that although the intellect does not directly know objects existing in time, it may operate within time, and be structured by time. The question of whether intellection is a temporal process that produces universal concepts which exist in time and endure was thus an important one in late Aristotelian psychology. Most authors considered Aristotle’s statement that in the individual potential knowledge is prior in time to actual knowledge, which they transformed into the

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<sup>27</sup> Johannes Magirus, *Anthropologia, hoc est commentarius eruditissimus in aurem Philippi Melanchthonis libellum de Anima* (Frankfurt: Wolfgang Richter, 1603), 590: “[intellectus]...species rerum materiatis abstrahat, educat, purificet & tegumenta loci, temporis, figurae, quantitatis, coloris, aliorumque accidentium, quae nec rei concernunt essentiam...”

<sup>28</sup> Franciscus Toletus, *Commentaria una cum quaestionibus in Aristotelis libros de Anima* (Cologne: In Officina Birckmann, 1594), 166v: “Primo, Intellectus utitur abstractione obiecti a loco, & tempore, & praesentia obiecti: non autem sensus.”

argument that the passive intellect precedes the active, suggesting that a form of temporal sequence may exist within the process of intellection.<sup>29</sup>

Aristotle's text suggested several ways in which intellection involved time, but the most commonly discussed was the passage at *De Anima* III.6 430b6–20, where he considered the distinction between thinking about indivisible and divisible objects. Indivisible objects are understood in cases where there is no question of truth or falsity, because truth and falsehood involve compounding thoughts into a unity; in these cases, the notion of time is also taken into account, in that a statement may be true or false in time: it might be accurate to connect the terms 'Socrates' and 'sick' whilst he is unwell, but not at other times, for example.<sup>30</sup> This enigmatic passage produced an emphasis on the concept of understanding *in time* amongst later commentators. The Coimbra commentator, for example, argued that the intellect understands magnitude in a twofold way:

One way, as it is potentially divisible, and thus it understands a line, by numbering one part after another: and thus in time, or successively. In the other way, as it is actually individual; and thus it perceives it as one thing that is composed of many parts and thus all at once. And therefore it connects time and longitude, understanding it similarly to be divided and not divided. Whence it cannot be said, that when that which is understood lacks parts, that half of it is understood in half the time, but all at once: just as if it were to have parts, the different parts would correspond to different parts of time.<sup>31</sup>

Similarly, the Italian Dominican Michaeli Zanardi (1570–1642) argued in his account of the passive intellect that its operations are twofold, one indivisible, "by which a thing is simply apprehended," and the other "is called composition and division, by which a thing is apprehended

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<sup>29</sup> See, for example, Fortunio Liceti, *De intellectu agente libros v* (Passau: Apud Gasparrem Crivellarium, 1627), 290; Johannes Baptista Rubeus, *Commentaria dilucida in tres libros Aristotelis de Anima* (Venice: Apud Ioannem Guerilium, 1602), 71; Dandinus, *De corpore animato*, 2000.

<sup>30</sup> Collegium Conimbricense, *In tres libros de Anima*, cols. 459–60: "Nam, verbi gratia, morbus & Socrates cohaerent inter se, dum Socrates aegrotat; si quis tamen pronuntiet Socratem aegrotasse, mutato praesenti tempore in praeteritum, falsum dixerit."

<sup>31</sup> *Ibid.*, cols. 461–2: "...potest nimirum intellectus magnitudinem duplicer intelligere; Uno modo, ut est divisibilis potentia, siveque intelligit lineam, numerando partem post partem: atque adeo in tempore, sive successive. Altero, ut est individua actu: & ita percipit eam, ut unum quid ex multis partibus constitutum, atque adeo simul. Ideoque subiungit tempus, & longitudinem similiter dividi, & non dividi intelligendo, Unde dici non potest, cum id, quod intelligitur, partibus caret, dimidium eius intelligi medietate temporis, sed simul: quemadmodum si partes habeat, diversis partibus respondere poterunt diversae partes temporis."

incommensurably with another.”<sup>32</sup> The two operations differ not only because simple understanding does not allow a distinction between truth and falsehood, but also because “the first is prior to the second, since we first understand a thing simply, before we compare it through reason with another.”<sup>33</sup> The notion of indivisibility in an object that we understand, Zanardi argued, can be understood in three ways:

Firstly, as it is a whole, not dividing it into parts, and thus it has a principle of indivisibility according to perception, and according to time, since it is also understood in indivisible time. Secondly, as the whole is divided into parts, understanding then the whole and the parts, and thus it is also divided according to time, as every part of the object corresponds to a part of time. Thirdly, as all the parts are understood together at once, and thus time corresponds proportionally to them. The second indivisibility is called according to form, as it is a simple thing, such as man, air, or water, etc. These things are understood as indivisibles in indivisible time, and if they are understood as divisible things, in divisible time, that is *per accidens*, because in themselves, that is, as forms, they are not divisible.<sup>34</sup>

These arguments about intellection in divisible and indivisible time demonstrate that late Aristotelian authors considered time both as that *in which* thought occurred, but also as something that structured thought itself. These discussions concerned the intellection of objects and concepts outside the soul. However, another strand of argument concerned the intellect’s reflexive understanding of itself, which for some authors also involved questions of time. Unlike the external senses, which cannot sense their own operation, in Aristotelian psychology the intellect has the capacity to become aware both of its operation, and of itself more generally. This notion of reflexive thought produced a complex and sophisticated debate amongst late renaissance Aristotelians, centred on the

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<sup>32</sup> Michaeli Zanardi, *Commentaria cum quaestionibus in tres libros de Anima Aristotelis* (Cologne: Sumpitus Antonii Boëtzeri sub signo Rubei Leonis, 1622), 141.

<sup>33</sup> *Ibid.*, 141: “Secundo, quia primo est secunda prior, cum rem prius simpliciter intellegamus, antequam cum alterius ratione eam comparemus.”

<sup>34</sup> *Ibid.*, 142: “Primo ut totum, non dividendo ipsum in partes, & sic habet rationem indivisibilis secundum appraehensionem, & tempus, cum etiam intelligatur in tempore indivisibili. Secundo ut totum divisum in partes, intelligendo tunc totum, & partes, & sic dividitur etiam secundum tempus, quis cuiilibet parti pars temporis correspondet. Tertio ut simul cum intelliguntur omnes partes, & sic ei proportionaliter correspondet tempus. Secundum indivisible dicitur secundum formam quia est res simplex, ut homo, aer, & aqua &c haec intelliguntur, ut indivisibilia in tempore indivisibili, & si intelligantur in tempore divisibile, ut divisibilia, hoc est per accidens, quia secundum se, scilicet ut formae, non habent, quod sint divisibiles.”

exposition of the passage from *De Anima* 429b9–11 that in Latin usually read *intellectus ipse autem seipsum tunc potest intelligere*.<sup>35</sup>

Time played a role within this discourse for authors such as Dandinus, who argued that the question of whether the intellect understands itself necessarily involves time, at least in part because of the role of temporal sequence within the soul. Dandinus paid particular attention to this issue in his *De anima* commentary. He explained the role of time in the Aristotelian discourse of reflexive thought in a suggestive but occasionally incomplete manner. Firstly, he suggested, we must recognise that a distinction exists in reflexivity between the active and the passive intellect (which he characterized as different modes of the same intellectual power), in which the passive intellect may know itself but the active cannot. This distinction depends upon a notion of time, according to Dandinus; he seems to have believed that the temporal distinction between active and passive intellects is also what separates them in relation to reflexivity.<sup>36</sup> Dandinus focused particularly on the temporal implications of the word *tunc* ('then') in *De Anima* 429b9–11. He argued that the crucial points in this passage are the 'time and manner' of the intellect's reflexivity. Thus, "By these words (*Et ipse tunc seipsum potest intelligere*) Aristotle does not intend so much to affirm that the intellect understands itself, as to show the time and manner of this understanding."<sup>37</sup> Consequently,

the time and manner of understanding have great obscurity. The time, because from its first origin and by the condition of its nature it does not lack only this, but every end of cognition. The manner, since although it is an immaterial abstract substance, like other intellects, nevertheless it does not exist in the same manner as them, but is the form of the body.<sup>38</sup>

On the face of it, the 'obscurity' that Dandinus diagnosed in Aristotle's text was not comprehensively resolved in his discussion. Essentially, he

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<sup>35</sup> Maclean, "Language in the Mind."

<sup>36</sup> Dandinus, *De corpore animato*, 1885: "Particula vero illa (tunc) duo mihi significat. Primum est; eandem esse intellectum substantiam, quae potestate dicitur, & habitu; & antea quidem, cum in sola potestate versaretur, cognoscere seipsum nequit, post vero aliorum intellectuum habitibus perfectus potest. Non enim diversam vox illa facultatem & substantiam cognoscentem, sed cognoscendi tempus significat."

<sup>37</sup> *Ibid.*, 1885: "Alterum; Aristotelem verbis hisce non tam asserere intellectum seipsum cognoscere, quam tempus & modum cognitionis ostendere."

<sup>38</sup> *Ibid.*, 1885: "Tempus autem & modus cognoscendi obscuritatem habebant plurimam. Tempus; quoniam a primo ortu & naturae suae conditione non hac modo, sed omni prorsus cognitione caret. Modus vero; quoniam etsi immaterialis & abstracta substantia sit, ut intellectus caeteri; non eodem tamem modo se habet, quo illi; sed corporis forma est."

suggested that the intellect cannot know itself in the same way as it knows other things, through sense and phantasms, because it is immaterial and incorporeal. The time at which the intellect knows itself is therefore “when it has become the singular things and has been perfected by the dispositions of the other cognitions.”<sup>39</sup> The active intellect cannot know itself until it has been perfected by all other cognitions; that is, only when it has knowledge of all other singulars and, in a sense, becomes those things. Only *then* (*tunc*) will it understand itself. Time in this sense is a turning point about which reflexive thought is balanced. This fragmentary discussion of the intellect’s reflexivity in time, which was echoed by other late Aristotelian authors, suggested, but did not entirely develop, interesting parallels with contemporary notions of the soul existing and locating itself in time.

The contribution of the concept of duration and persistence in time to discussions of intellection was also important. It was particularly prominent in discussions of intellectual memory, which raised questions of whether, and for how long, intelligible species and mental concepts endure. Intellectual memory was understood to parallel the form of memory found in the sensitive part of the soul, in that it conserved intelligible species and mental concepts after the process of intellection was complete. However, its special and distinct nature was emphasized by various authors. The fact that intellectual memory was a power of the rational part of the soul meant that it necessarily operated on somewhat different grounds to sensitive memory. The Spanish physician Gutierrez de Godoy, for example, argued that the operations of the intellect do not properly fall under the subject of medicine, which can deal only with the corporeal body and the symptoms of the internal senses.<sup>40</sup> Intellectual memory had two features that particularly interested late Aristotelian authors: its ability to conserve past mental concepts, and its role in the separated soul,

<sup>39</sup> *Ibid.*, 1885: “Tempus igitur illud est, cum singula factus & aliarum cognitionum habitibus perfectus fuerit. Modum autem hunc indicat, qui ex caeterum rerum cognitione deducitur. Cum enim eum scribit seipsum tunc intelligere, cum fuerit singula factus resque alias cognoverit: Profecto cognitionem eam significat antecedere oportere, veluti necessariam ad illum in sui ipsis cognitionem inducendum.”

<sup>40</sup> Johannes Gutierrez de Godoy, *Disputationes philosophicae, ac medicinae super libros Aristotelis de Memoria, & Reminiscentia, physicis utilis, medicis necessariae duobus libris contentae* (Jaen: Apud Petrum a Cuesta, Typographum Giennensem, 1629), 6v: “Nihilo minus, quia spiritualis est, & altioris ordinis ab his, quae sub medicinae obiecto cadunt; medicus non agit de correctione intellectus, etiam si agat de symptomatum internorum sensum castigatione, quia materiales sunt, & organo corporeo insident.” On Godoy, see Lohr, *Latin Aristotle Commentaries*, 178.

which survived the death of the corporeal body. Intellectual memory as a means of preserving thoughts after death had important theological implications that these authors developed in different ways. Doctrinal disagreements between Scotist and Thomist authors played a significant part in structuring this debate.

Scotist authors such as Hugo Cavellus (c. 1571–1626), Mastrius and Beluti typically supported the existence of the concept of intellectual memory. Cavellus, who was Professor of Theology in Louvain and Rome and later bishop of Armagh, argued in his questions on *De Anima* that experience shows “we must recall our acts, otherwise we could not delight or despair of the past: and it cannot be said that this is done through sensitive memory, because we do penance for evil spiritual acts, which sense does not know.”<sup>41</sup> He dismissed the objection that the intellect only knows universals, which “are abstracted from past and future”, by arguing that although the intellect does not know singulars in themselves (*sub ratione singularitatis*), it does know them in some respects.<sup>42</sup> Arguments for the intellection of singulars were characteristic of this position on intellectual memory. However, although intellectual memory preserves thoughts even after death, it is not formally distinct from the intellect itself. Cavellus argued that “intellectual memory is really the intellect itself.”<sup>43</sup> The identification of intellectual memory with the intellect itself depended on Cavellus’ concept of the twofold structure of memory. Memory, he suggested, can be seen as the conservation of species, “and in this sense, it is nothing other than the intellect itself, insofar as it conserves them; by which it is given the ability to produce these intellections, and thus it

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<sup>41</sup> Hugo Cavellus, *Doctoris subtilis Io Duns Scotus quaestiones super libris Aristotelis de Anima... & commentario, seu annotationibus longioribus illustratae atque discussae* (Lyon: Sumptibus Claudi Landry, 1625), 333: “Dico primo datur intellectiva memoria. Patet experientia, quia recordamur actuum nostrorum, alioquin de praeteritis nec gaudere, nec dolere possemus: nec dici potest hoc fieri per memoriam sensitivam, quia poenitentiam agimus de malis actibus spiritualibus, quos sensus non novit.” On Cavellus, see Lohr, *Latin Aristotle Commentaries*, 87.

<sup>42</sup> *Ibid.*, 333: “Obiecties primo, obiectum intellectus est universale, 1 *phys.* & 2 *de anim.* & hoc abstrahit a *fuisse*, & *fore*; ergo non datur memoria intellectiva, quia haec respicit necessaria fuisse. Respondetur antecedens verum esse, quoad intellectionem scientiarum tantum, qualis est sola abstractiva: ostensum enim est supra q22 singulare intellegi posse a nobis: Dices, sed intellectus pro nunc non cognoscit singulare qua tale; ergo non recordatur. Respondetur sufficere quod cognoscat singulare, esto non sub ratione singularitatis.”

<sup>43</sup> *Ibid.*, 333–4.

is called productive memory (*memoria foecunda*).<sup>44</sup> The second aspect of memory is “the conservation of past things as such, and it is called recall, that is the cognition of a past act as such.”<sup>45</sup> This second aspect takes two forms, remote and proximate, depending on whether the past act occurred to the being that remembers, or was performed by it.<sup>46</sup> The first form of memory involves the passive intellect as it is informed by intelligible species; as this process elicits an action, the intellect knows or understands, and as it conserves the species, it exhibits the second form of memory.<sup>47</sup> Cavellus’ discussion of intellectual memory was informed by its theological significance, and his disputation on the separated soul considered whether the intellect can recall the acts that it performed whilst conjoined with the body.<sup>48</sup> His account also demonstrated a key characteristic of contemporary discussions of intellectual memory: a concern with the philosophical implications of the human subject acting in time. For most late Aristotelian authors, the intellectual powers were the *sine qua non* of any identifiably human existence. Within this framework, intellectual memory in particular was charged with preserving our actions (and specifically our morally culpable actions) and our distinctive rationality over time.

Mastrius and Belluti’s treatment of intellectual memory in their comprehensive Scotist course was less sophisticated than that of Cavellus. It simply treated intellectual memory as “the power of conserving past species insofar as they are past, which is consequently called recall.”<sup>49</sup> Mastrius and Belluti opposed this position to what they called the Thomist argument that “because the object of the intellect is universal, that abstracts from past and future, therefore intellectual memory, which is recollection,

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<sup>44</sup> *Ibid.*, 332: “Nota primo duplicter sumi memoria. Primo prout dicit conservationem specierum, & hoc sensu, nihil aliud est, quam ipse intellectus, ut eas conservat, quibus efficiunt potens producere intellectiones, & sic, vocatur memoria foecunda.”

<sup>45</sup> *Ibid.*, 333: “Secundo modo, ut est conservativa praeteritorum qua talia, & dicitur recordatio, quae est cognitio actus praeteriti, qua talis.”

<sup>46</sup> *Ibid.*, 333.

<sup>47</sup> *Ibid.*, 333–4: “Intellectus ergo ut specie informatus, est memoria foecunda; ut actum eliciens, intellectus vel intelligentia; ut conservans species ad recognoscenda obiecta eam cognita, & ipsas cognitiones, memoria recordativa.”

<sup>48</sup> *Ibid.*, 388.

<sup>49</sup> Mastrius & Belluti, *Philosophiae ad mentem Scoti*, 154: “Sed nunquid concedenda est etiam in parte intellectiva memoria sumpta pro potentia, conservativa specierum praeteritorum, quatenus praeterita sunt, quae proinde recordativa dicitur . . .”

cannot exist, only sensitive memory.”<sup>50</sup> This position amounted to a denial that the intellect operates in time. This was opposed both by Scotus and by common experience, they suggested, because “we experience that we recall our past concepts of things that are not only universal, which we have known once and cannot be related to sensitive memory, but also of singular things.”<sup>51</sup> Scotus argued that “we remember our evil spiritual actions, that are not attributed to sense and do penance for them by recognizing them with their circumstances of place and time.”<sup>52</sup> Like Cavellus, Mastrius and Belluti concluded with a discussion of the role of intellectual memory in the separated soul.<sup>53</sup>

Discussions of the character of intellectual memory were not limited to Scotist philosophy courses. The Thomist commentary of the *Collegium Complutense*, for example, cited Aquinas and argued that intellectual memory is “the ability to conserve intelligible species, and also the power of handling an intelligible object, as it was formerly known.”<sup>54</sup> Intelligible species must be preserved for some time in the passive intellect, because they were received there for a period of time.<sup>55</sup> Like the Scotists, the Alcalá commentator did not formally distinguish intellectual memory from the passive intellect.<sup>56</sup> This was because the passive intellect can receive and conserve intelligible species, and therefore it can also “understand its own object as formerly understood”, that is, understand that it

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<sup>50</sup> *Ibid.*, 154: “Negat D Thom ppq 79 art 4 & 1 contra gentes c 74 fundamentum eius est, quia objectum intellectus est universale, quod abstrahit a fuisse, & fore, ergo non datur memoria intellectiva, quae sit recordativa, sed tantum sensitiva.”

<sup>51</sup> *Ibid.*, 154: “& patet experientia, experimur enim nos recordari praeteritorum conceptum rerum non tantum universalium, quas semel cognovimus, nec potest attingere memoria sensitiva, sed etiam singularium ...”

<sup>52</sup> *Ibid.*, 154: “...imo & nos de praeteritis actibus spiritualibus malis, quos sensus non attingit, poenitentiam agimus, illos recognitando cum suis circumstantiis loci, & temporis ...”

<sup>53</sup> *Ibid.*, 154.

<sup>54</sup> *Collegium Complutense, Disputationes in tres libros Aristotelis de Anima* (Paris: Sumpitus Dionysii Thierry, via Iacobaea, sub signo S. Dionysii prope D. Benedictum, 1633), 492: “Dicendum est primo, si memoria sumatur pro potentia spirituali habente: tum virtutem conservativam specierum intelligibilium, tum etiam vim attingendum obiectum intelligibile, ut antea cognitum; revera in parte intellectiva dandam esse memoriam.”

<sup>55</sup> *Ibid.*, 493: “Quoniam necesse est, ut species intelligibiles receptae in intellectu possibili saltem per aliquod tempus, ibidem conserventur.”

<sup>56</sup> *Ibid.*, 497: “nam propterea idem visus potest percipere quodlibet visibile, qua quodlibet continenter sub suo obiecto, scilicet visibile: ergo cum ens in esse intellecti continetur sub ratione entis: consequens est, ut intellectus possibilis, qui versatur circa ens in communi, possit etiam versari circa illud in esse intellecti, quod, ut modo dicebamus, est proprium officium memoriae intellectivae.”

is past.<sup>57</sup> The Coimbra commentary on the *Parva naturalia* adopted a similar position. The Coimbra commentator cited Aquinas' opinion on whether the conservation of intellectual species is properly memory.<sup>58</sup> Aquinas argued that, although sensitive memory necessarily involves an awareness of the condition of past time, which is bound up with the singular conditions of being, this does not automatically rule out the existence of a distinct intellectual memory conceived of as an operation of the passive intellect that conserves intelligible species abstracted from material conditions.<sup>59</sup> The Coimbra commentator's discussion of the relationship between intellectual memory and the intellect itself followed a similar pattern to that of the Alcalá commentary. He also cited the mental triad of memory, intellect and will found in Augustine's *De trinitate* as evidence against the identification of intellectual memory and the passive intellect.<sup>60</sup> Nevertheless, he argued for a real identification between the two powers, because the passive intellect, as the "place or storehouse of species," performs the function of memory in conserving those species.<sup>61</sup> Also, the principle of economy dictated that needlessly multiplying mental faculties is unnecessary.<sup>62</sup> Identifying the ability to record the past with the intellect itself gave the rational soul a temporal aspect; lying behind the concept of intellectual memory is the notion that, although the intellect is

<sup>57</sup> *Ibid.*, 497: "Nam intellectus possibilis potest recipere, & conservare species intelligibles, ut in priori assertione diximus: ergo potest intelligere suum obiectum antea intellectum; atque adeo poterit habere rationem memoriae intellectivae."

<sup>58</sup> Collegium Conimbricense, *In tres libros de Anima*, cols. 3–4.

<sup>59</sup> *Ibid.*, col. 3. The relevant passage is Aquinas, *Summa theologiae*, vol. II, 217: "Memoria vero in parte sensitiva ponitur, quia est alius prout cadit sub determinato tempore: non est enim nisi praeteriti. Et ideo, cum non abstrahat a singularibus conditionibus, non pertinet ad partem intellectivam, quae est universalium. Sed per hoc non excluditur quin intellectus possibilis sit conservativus intelligibilium, quae abstrahunt ab omnibus conditionibus particularibus."

<sup>60</sup> Collegium Conimbricense, *In tres libros de Anima*, col. 4: "Accedit testimonium D. Augustini 10. de Trinitate c11.ubi tria in mente constituit, memoriam, intelligentiam & voluntatem: additque horum unum, nempe intelligentiam, oriri ex memoria. Cum igitur nihil ex se ipso oriatur, patet, memoriam & intellectum non eandem esse animi facultatem, sed aut re, aut saltem essentia inter se distingui."

<sup>61</sup> *Ibid.*, cols. 4–5: "Aserendum tamen est; intellectum & memoriam intellectivam, unam eandemque esse animi facultatem, nec re, nec specie diversam. Primum, quia eiusdem est, servare habitus & iit uti: at intellectus servat habitus memorandi, id est, species intelligibles; ut docet Aristoteles lib.3. de anima cap.4.tex.7. ubi intellectum patientem appellat locum, seu thesaurum specierum. Quare idem intellectus eademq; facultas erit, quae iis utitur intelligendo & memorando."

<sup>62</sup> *Ibid.*, col. 5: "Tertio, quia frustra ponitur facultatum multitudo, ubi satis est una eademq; potentia: sat est autem una potentia ad intelligendum & recordandum, non minus quam ad apprehendendum & judicandum."

atemporal, it necessarily engages with a temporal world and may preserve remnants of that engagement through the power of memory.

Thomist and Jesuit commentators followed Aquinas's treatment of intellectual memory closely, and were also frequently influenced by Augustine's trinitarian model of memory and the intellect. However, although Aquinas's discussion was always influential, Protestant authors typically adhered less strictly to the Thomist or Scotist reading, and often produced more eclectic accounts of intellectual memory. Christoph Scheibler's *Liber de anima*, for example, cited Aquinas on the identification of intellectual memory with the intellect itself.<sup>63</sup> Bartholomaeus Keckermann argued that intellectual memory concerns man insofar as he is human, and depends on sensitive memory just as the intellect depends on sense.<sup>64</sup> The intellect itself has two powers or capacities, 'the power of knowing' and 'the power of conserving', which is intellectual memory.<sup>65</sup> Intellectual memory consists of "the power of conserving images of objects known by the intellect."<sup>66</sup> It is divided into primary and secondary aspects. Primary intellectual memory is "that by which images formed and judged by the intellect are strengthened, sustained and confirmed so that they might not vanish."<sup>67</sup> This power of conservation depends on the process of intellection that preceded it, and can therefore be distinguished according to the divisions that Keckermann applied to the intellect itself: "Therefore just as the intellect is either more perfect, or more imperfect, without being either simple or composite, thus memory is clearly either more perfect or more imperfect."<sup>68</sup> Perfect memory, "by which images of simple

<sup>63</sup> Christoph Scheibler, *Liber de anima* (Marburg: Apud Chemlinum, 1627), 334: "Georgius Reischius lib.ii. Margar.phil.c.3. ex veteribus tres numerat animae rationalis potentias: Intellectum Voluntatem & Memoriam. sed ut maxime concedenda sit memoria intellectiva: tamen ea non videtur peculiaris esse animae facultas, cum sub intellectu contineatur, docente Thomas I.part.summ.q.79.art.7."

<sup>64</sup> Keckermann, *Operum omnium... tomus primus*, col. 1525: "I. Distinguenda est memoria sensualis, de qua hoc loco agitur, a memoria intellectuali, de qua agetur suo loco circa proprietates hominis, quatenus homo est. II. Interim tamen sicut intellectus pendet a sensu: ita quoque memoria intellectualis pendet a memoria sensuali."

<sup>65</sup> *Ibid.*, cols. 1618–19: "Intellectus hominis duplicum in se vim habet, atque ita etiam duplicerit distinguitur; nempe in vim cognoscendi, de qua hactenus, & in vim cognita conservandi, de qua nunc agendum est."

<sup>66</sup> *Ibid.*, col. 1619: "Intellectualis vero memoria est vis conservandi imagines obiectorum intellectu cognitorum."

<sup>67</sup> *Ibid.*, col. 1619: "Est autem memoria intellectualis vel prima, vel orta. Prima memoria est, qua imagines ab intellectu formatae & diiudicatae firmantur, sistuntur & confirmantur ne evanescant."

<sup>68</sup> *Ibid.*, col. 1619: "Sicut ergo intellectio est vel perfectior, vel imperfectior, sine vel simplex, vel composita; ita plane memoria est vel perfectior, vel imperfectior."

objects are conserved," equates to the simple intellect.<sup>69</sup> As the simple intellect and its memory relate to things themselves, they can be termed 'principal'; as they relate to words describing those things, they are called 'less principal'.<sup>70</sup> The knowledge of words depends on the knowledge of things, and is consequently less perfect; according to Keckermann, the same argument applies to our memory of these things. The principle that the understanding and memory of imperfect entities depends on that of perfect entities is also extended to the level of being itself, for Keckermann argued that our memory of imperfect or fictitious beings depends on our memory of real beings.<sup>71</sup>

Composite memory, on the other hand, relates to objects and concepts that the simple intellect has composed or constructed through words: "Imperfect or composite memory is that through which we conserve things, as much as words, which have been conjoined or composed."<sup>72</sup> This form of verbal intellectual memory concerns propositions and syllogisms, but depends on the memory of simple words. Keckermann's account of intellectual memory explored the secondary functions of the Aristotelian intellect to a greater extent than that of many other commentators. Consequently, he offered a sophisticated model of how particular past mental operations are recorded and processed. This also extended to different disciplines and their relationship to the practical and theoretical aspects of the intellect. Intellectual memory for Keckerman also explained differences in natural talent and ability:

For just as the intellect is also either theoretical or practical, and again the practical intellect is either moral or productive; memory is also thus; whence it is that some men easily retain things taught in theoretical disciplines, but others retain things taught in moral sciences better, as in Ethics and Politics: again others successfully retain things pertaining to building and construction; because memory is a consequence of the power of understanding, so

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<sup>69</sup> *Ibid.*, col. 1619.

<sup>70</sup> *Ibid.*, col. 1620: "Sicut etiam intellectus simplex est vel principalis, nempe ipsarum rerum; vel minus principalis, nempe verborum: ita etiam memoria simplex principaliter est rerum memoria, minus principaliter autem verborum."

<sup>71</sup> *Ibid.*, col. 1620: "Denique intellectio improprie dicta, quae est non entium, pendet ab intellectione proprie dicta sive verorum entium; ita quoque memoria entium factorum per omnia dependet a memoria entium verorum."

<sup>72</sup> *Ibid.*, col. 1620: "Memoria imperfectionis sive composita est per quam conservamus tam res, quam verba coniuncta sive composita."

that someone who is strong in the speculative intellect, can easily retain speculative objects: and similarly in morals and matters of production.<sup>73</sup>

This argument clearly emphasizes the connection between intellectual memory and notions of the subject's particular and distinct temporal existence. The nature of the intellect's engagement with time through intellectual memory determines our aptitude for different disciplines. Keckermann's discussion of intellectual memory demonstrates how the concepts of duration and time were believed to structure not only the operation of the intellect but also the nature of human character in a fundamental way.

However, although discussions of the role of intellectual memory were widespread in the late renaissance Aristotelian tradition, not all authors accepted that the intellect was temporal in this way. Indeed, the opposite position—that thoughts and mental concepts have only a momentary existence in the mind—which is associated with the medieval Arab philosopher Avicenna was adopted by several authors. The most influential of these was Iacopo Zabarella, who argued in his treatment of intelligible species in the *De rerum naturalibus* and in his *De anima* commentary that “impressed species (*species impressae*) neither precede intellection in time, nor can remain after it.”<sup>74</sup> Zabarella based his argument on the commentaries of Avicenna and Averroës, arguing that there can be no intelligible species in the intellect except when intellection actually occurs.<sup>75</sup> He noted that “If species were imprinted in the intellect in the manner of a habit, then the intellect would necessarily always understand them”: however, he argues, this is manifestly false.<sup>76</sup> Species cannot be imprinted on the passive intellect unless they are abstracted from matter “and denuded

<sup>73</sup> *Ibid.*, col. 1620: “Sicut etiam intellectus, atque adeo ingenium est vel Theoreticum vel practicum, & practicum iterum vel morale, vel fabricativum; ita etiam memoria; unde sit, quod nonnulli homines facile retineant res traditas in disciplinis theoreticis; alii vero melius retineant res traditas in moralibus, ut in Ethicis, Politicis: alii denique retineant feliciter res pertinentes ad fabricam & ad opificia; quia nempe memoria sequitur vim intelligendi, ita ut is qui pollet intellectu speculativo, facile possit retinere obiecta speculativa; & sic in moralibus & fabricativis.”

<sup>74</sup> Iacopo Zabarella, *De rebus naturalibus libri xxx* (Frankfurt: Sumptibus Lazar Zetzneri, 1607), col. 899: “...species impressae nec praecedere intellectionem tempore, nec post eam servari possint...”

<sup>75</sup> *Ibid.*, col. 899: “Ad hoc demonstrandum nullum est efficacius argumentum illo, quod a D. Thoma refertur, tanquam argumentum Avicennae in I. part. Summae, quaest. 79. artic. 6.”

<sup>76</sup> *Ibid.*, col. 899: “Si species ad modum habitus imprimetur in intellectu, intellectus necessario eam semper intelligeret: consequens manifeste falsum est.”

of material conditions,” but this process of abstraction constitutes an act of the intellect, and to locate species in the intellect without an act of intellection implies a contradiction.<sup>77</sup> According to Zabarella, for intelligible species or mental concepts to remain in the passive intellect would mean that the intellect always thinks, which is impossible. This position, which was supported by Descartes but famously ridiculed by Locke in the *Essay Concerning Human Understanding*, almost amounted to attributing eternal duration to the process of intellection.<sup>78</sup> Whilst many late Aristotelian authors agreed that intellection occurs in time, few made it eternal.

Zabarella’s position rested on the notion that cognition and conservation are two formally distinct mental powers that cannot be combined in the same organ or faculty.<sup>79</sup> It is also impossible for one faculty to perform several functions at the same time, “just as it is impossible for matter to have several specific forms.”<sup>80</sup> Zabarella also cited Averroës, who argued that intelligible species, like their sensible counterparts, remain only as long as the object from which they are derived. Therefore, just as the species of colour remains whilst the real colour is present, intelligible species remain only whilst the phantasm from which they are abstracted is present.<sup>81</sup> In this section, Zabarella attacked the role of time in intellection

<sup>77</sup> *Ibid.*, cols. 899–900: “...species non potest imprimi in intellectu, nisi abiuncta a materia, & nudata conditionibus materialibus; at secundum Aristotelem in contextu 15. & 16. lib. 3 de Anima, omne abiunctum a materia est actu intelligibile, immo est actu intellectum, immo est idem quod intellectio, & quod intellectus ipse; ergo species in intellectu impressa intellectio ipsa est, idque asserit expresse Aristoteles in contex. 15.20.27.37.libri 3 de Anima; igitur ponere in intellectu speciem sine intellectione est pugnantia dicere, & implicare contradictionem, quia tantum abest ut species in intellectu esse posse sine intellectione, ut potius sit ipsamet intellectio.”

<sup>78</sup> The relevant passage is at Book II, Chapter I, section 10 of the *Essay*; John Locke, *An Essay Concerning Human Understanding*, ed. Peter Nidditch (Oxford, Clarendon Press, 1979), 108–9.

<sup>79</sup> Zabarella, *De rebus naturalibus*, col. 900: “Ad huius autem veritatis confirmationem notandum est artificium naturae in facultatibus animae sentientis: quum enim oportuerit duas in hac animae parte inesse vires, unam cognoscendi, altera retinendi, ac conservandi imagines rerum, natura non tribuit eidem facultati, neq; eidem organo utramq; vim simul, sed voluit memoria, quae conservativa est, non esse cognoscitiva, & imaginativa, quae est cognoscitiva, non esse conservativam.”

<sup>80</sup> *Ibid.*, col. 900: “quare si phantasia, quae cognoscitiva est, conservaret etiam phantasmata recepta, & memoria, quae est conservativa, cognosceret etiam imagines in ea servatas, cognosceret multa simul eodem momento, quod penitus impossibile est; quoniam contemplari, vel imaginari eodem tempore plura ita est impossibile, ut est impossibile materiam simul habere plures formas specificas.”

<sup>81</sup> *Ibid.*, col. 902: “cognovit Averroës formas intelligibiles ita esse in intellectu, ut sunt res sensiles in organo sensus, nimirum praesente solum obiecto; tandiu enim inest species

in several ways. Firstly, he denied that mental concepts endure, and that the intellect has a specifically temporal component; secondly, he denied that temporal sequence plays a role in the intellect by denying that intelligible species precede or remain 'in time' after intellection. These arguments were also found to an extent in his treatment of sense. Zabarella's denial of intellectual memory may be related to his Averroist position on the immortality of the soul, but it also represented a broader rejection of the notion that the intellect has a temporal component. In this respect, it was directed against both the Scotist and Thomist positions, and also against a more general current in late renaissance Aristotelianism.<sup>82</sup>

Zabarella's position was influential amongst many later Aristotelian authors, particularly in northern Europe. Certainly, echoes of his position on time and the intellect are evident in the textbooks of the German Lutheran Johannes Magirus (c. 1560–1596), who studied under Zabarella at Padua and was Professor of Natural Philosophy and Physiology at Marburg University from 1591.<sup>83</sup> Like Zabarella, Magirus questioned whether the continued duration of intelligible species in the intellect means that it must continually understand, and argued that "*species impressae* neither precede intellection, nor remain in the intellect after intellection."<sup>84</sup> However, Magirus did not deny intellectual memory, but instead suggested that intellection as a process of imprinting intelligible species cannot be temporal. This was a reduced version of the argument found in Zabarella and Avicenna. Magirus did not have any apparent theological objection to the concept of intellectual memory, nor did he develop arguments against the temporality of the intellect itself. Instead, he followed Zabarella only in his objection to conceiving of mental processes such as sense and intellection as temporal sequences. This reading, from an author who in other respects was strongly influenced by Zabarella, indicates the limited weight given to arguments against the role of time in the intellect in the early seventeenth century. Criticisms of Avicenna's argument appeared in a range of texts from this period, and on the whole late Aristotelian

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coloris in oculo, quandiu praesens est realis color; ab hoc enim pendet in fieri, & in conservari: sic tandiu est in intellectu species intelligibilis, quandiu est in phantasia phantasma actu, & cessante phantasmate cessat intellectio, & species intelligibilie evanescit, quoniam a phantasmate pendet in esse, & in conservari: quo sit ut intellectio formaliter sit praesentia speciei in intellectu, causaliter vero sit praesentia phantasmatis actu in phantasia."

<sup>82</sup> *Ibid.*, col. 901, cols. 902–3.

<sup>83</sup> On Magirus, see *Cambridge History of Renaissance Philosophy*, 825.

<sup>84</sup> Magirus, *Anthropologia*, 603.

authors were more likely to reject the idea that intellection involves temporal sequence than to deny intellectual memory.

### *Time and the Sensitive Soul*

#### *Time and Sense*

Debates about the role of time in relation to the intellect did not represent the full extent of discussions of time in late Aristotelian psychology. The relationship between time and the sensitive soul (which included the powers of sensation, imagination and sensitive memory) were also important. This relationship seems at first glance less problematic than that between time and the intellect, because late Aristotelian authors straightforwardly identified the sensitive soul with temporal operations and objects—in the case of sense with present objects, and in the case of memory with past objects. The *De Anima* tradition portrayed the internal and external senses as temporal powers that were concerned with objects in time. In their discussions of sensation, late Aristotelian authors developed arguments about the way in which man can have an awareness of time through the internal and external senses, and of the role that temporal sequence plays in sensation itself.

These discussions concerned the role of the senses in the perception of time, but also the way that time itself affects the act of sense-perception. They stemmed ultimately from Aristotle's identification of time with motion in *Physics* IV. For although the intellect numbers motion to produce time, it first perceives that motion through sense-perception. This two-stage process places sense-perception at the root of our awareness of time. Most late Aristotelians therefore attributed both intellectual and sense-perceptual content to time—that is, they argued that we are aware of time through the operation of both the rational and the sensitive powers of the soul. These two elements came from Aristotle's definition of time as the "number of former and latter in motion." As a number, time must relate to the intellect, because only the rational soul can number. However, this number depends on the substrate of time, motion, which is a common sensible that is perceived by the sensitive soul. Most late Aristotelian *Physics* commentaries and textbooks made it clear that time contains an element that is perceived by sense, but few went beyond this bare assertion.

However, the connection between time and sense in late renaissance commentaries and textbooks was in fact more complex than this sketch suggests. I argue that treatments of this issue in late renaissance *De Anima*

commentaries constituted an attempt to flesh out the perceptual content of time beyond the brief discussions in commentaries on the *Physics* by locating where and how the sense-perception of time occurs. However, it is worth noting that these commentators placed limits on the role of the sensitive soul in time, and that they were unwilling to argue that time itself is perceived by sense.

### *Time and Motion*

The relationship between time and motion that was so central to the late Aristotelian concept of time produced a number of significant philosophical issues. For, although most late sixteenth- and early-seventeenth-century commentators acknowledged that an awareness of time depends on our perception of motion, they believed that this perception does not depend solely on present sense-impressions, but also involves an awareness of past and future time, and therefore the faculty of memory. Motion is a continuous or successive entity, and was thus considered as a movement from the past into the future. To some commentators, its continuous or successive nature suggested that motion cannot be perceived solely through the external senses, because its past and future parts must somehow be apprehended and joined together by the mind. The Alcalá commentator, for example, argued that “motion, since it is something successive, essentially involves the past and future. And consequently it cannot be perceived unless the past and the future are known: but external sense is unable to perceive these two things, since it perceives only that which is present.”<sup>85</sup> The Alcalá commentary argued that having a sense of motion in itself involves an awareness of the past and future, and of the temporal sequence that connects the two states. External sense perception, however, cannot make us aware of this succession or sequence, since it is oriented only towards the present. The idea that the perception of motion involves mentally joining or collecting its past and future parts ruled out the external senses from at least part of this process. This position was set out by Zanardi, who argued that “motion exists by reason of former and latter things, that is past and future. But past and future are

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<sup>85</sup> Collegium Complutense, *Disputationes... de anima*, 176: “... quia motus, cum sit quid successivum, essentialiter importat praeteritum, & futurum. Ac proinde non poterit percipi nisi praeteritum, & futurum cognoscatur: at sensus externus nequit haec duo percipere, siquidem tantum percipit id, quod est praesens.”

not apprehended unless by memory.”<sup>86</sup> Sense, on the other hand, concerns only present objects.

The status of motion as one of the common sensibles complicated the issue further. Common sensibles are abstract qualities such as motion, number and shape that relate to more than one external sense. Many authors believed that they are perceived by the common sense (*sensus communis*), rather than by individual external senses. Therefore, although some commentators connected motion with temporal awareness, and specifically with memory of the past, some argued that it is instead perceived by the common sense alone. Also, the close relationship between time and motion raised the question of whether time should also be numbered among the common sensibles. Many commentators and textbook authors considered this point, but they generally agreed that time is not an independent common sensible, but is instead extrapolated from motion. The Alcalá commentator, for example, denied that there are more common sensibles than the conventional six, because all other possibilities can be reduced to these. Thus time “must be reduced to motion because it is an affection of it,” and has the same successive mode of being as motion.<sup>87</sup> Since time follows motion in its being and existence, our perception of it is in part dependent on our perception of motion. This was a position echoed by the Italian commentator Antonio Scaynus (1524–1612), who argued that time must be perceived by the same faculty that perceives motion, that is by the common sense, but that man knows time insofar as it is numbered according to former and latter, “by the intervention of the intellective faculty.”<sup>88</sup> Our sense of time is therefore radically dependent upon a sense of motion, which is the substrate of time, for although the intellect numbers and in a sense constitutes time, memory and common

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<sup>86</sup> Zanardi, *In tres libros de Anima*, 66: “Motus non apprehenditur sensu exteriori. Igitur non est sensibile commune. Probatur antecedens. Nam de ratione motus est prius, & posterius, id est praeteritum, & futurum. Sed praeteritum, & futurum non apprehenduntur nisi per memoriam.”

<sup>87</sup> Collegium Complutense, *Disputationes... de Anima*, 175: “Quoad ultimam vero partem etiam constat, quia si quae sunt alia sensibilia communia, ut tempus, unitas, situs, distantia, reducuntur ad ista, quia tempus debet reduci ad motum tanquam affectio eius, & habens eundem modum essendi successivum una cum illo.”

<sup>88</sup> Antonio Scaynus, *Paraphrasis... cum adnotationibus in libros Aristotelis de Anima...* (Venice, 1599), 66: “Et quo tempus sentimus; innuitur sensus communis, & consequenter phantasia; utraque enim facultate percipitur motus, & consequenter tempus; quod deinde mediante dicto sensitivo, interventu intellectivae facultatis, homo per seipsum percipit, atque cognoscit, sub ratione numeri per prius & posterius considerati.” On Scaynus, see Lohr, *Latin Aristotle Commentaries*, 406–7.

sense also play an important initial role in its perception. The notion that multiple mental faculties are involved in the perception of time was emphasized to a far greater extent in the *De anima* tradition than in contemporary *Physics* commentaries.

### *Time and the Internal Senses*

A more detailed exposition of this question featured in the *De Interiori Sensu Libri Tres* (1622), a treatise on the internal senses by the Spanish cleric Juan de Guevara, who was a member of the Order of Friars Minor. Like several other late Aristotelian textbooks, including Fortunio Liceti's work on the agent intellect, *De Intellectu Agente* (1627), Guevara's work restricted itself to a single element of the *De Anima* tradition. Guevara's textbook clearly illustrates the more general late Aristotelian concern with this aspect of the perception of time.

When discussing the perception of magnitude and time—what he termed the predicates of quantity—Guevara questioned if time is really perceived by the internal senses. Time is the number of motion, he noted, and thus it appears “that it can by no means be perceived without the connection of those parts of motion, and without great reflection of the intellect.”<sup>89</sup> Since time is composed of past, present and future parts, the perception of time necessarily involves connecting those parts. Guevara recognized, however, the opinion that the internal senses may play a role in constituting time that is equal to that of the intellect: “Nevertheless some add that perhaps if it is perceived, this is according to the reality that time has in common with motion. But although time is sensed together with motion, and is not experienced otherwise, nevertheless we judge... that it can be truly and properly perceived by the internal senses.”<sup>90</sup> In the case of magnitude, “that which is distinguished by sense, is not necessarily discerned according to every singular essential predicate, but it is sufficient that it should be known through something, or with regard

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<sup>89</sup> Ioannis De Guevara, *De interiori sensu libri tres* (Rome: Ex Typographia Iacobi Mascalardi, 1622), 52: “Cum igitur iuxta definitionem Aristotelis, tempus sit numerus motus secundum prius, & posterius, haud quamquam absque collatione ipsarum partium motus, & maxima reflexione intellectus, id percipi posse videtur.”

<sup>90</sup> *Ibid.*, 52–3: “Addunt tamen aliqui, si forte percipiatur, id esse secundum realitatem, quam tempus communem habet motu. Verum tempus licet simul cum motu sentire, & non aliter experiatur, vere tamen, ac proprie a sensu interiori percipi posse existimamus cum Aristotele 4 *Physic* tex 98 & de memor & reminisc cap 1 & 2.”

to something.”<sup>91</sup> The ‘something’ in question, Guevara suggested, is motion. Instead of being known in itself as a predicate or category, time is sensed as an accident of continuous quantity. We can therefore say it is sensed ‘through’ or according to motion. In this respect time is the duration and extension of the parts of motion, “or the form, through which those parts are extended in order in a succession, not in a coexistence all at once, but one after another”: time must therefore be perceived together with those parts of motion.<sup>92</sup> As Guevara emphasized, motion is slow or fast, and its speed or tardiness are forms of duration. Consequently, sense perception of the speed or tardiness of motion also implies perception of the duration of its parts, and thus a perception of time.<sup>93</sup> Therefore “sense is affected in diverse ways by motion, according to the diversity of extension of that thing which is called time.”<sup>94</sup> This passage exceeded the association of time with motion established in the *Physics* commentary tradition to explain how its sensitive component is perceived. Here, he advanced a more detailed position on the relationship between time, motion and sense, relying on an understanding of time as the duration of motion. Guevara claimed that insofar as it is a form of duration of the parts of motion, time may be perceived by the internal senses—or perhaps first by external sense-perception. Significantly, this passage employs *percipere*, ‘to perceive’, throughout.

Like many other late Aristotelian authors, Guevara also considered the category *Quando*, ‘when’. He suggested that this category can be treated in two ways, either “distinctly and formally, according as it is a form or duration by which things are constituted in a space of imaginary time,” language which conspicuously echoed that of Suárez and the *Categories* commentary tradition discussed in Chapter One, or “confusedly, or materially together with the thing that endures, according as it endures more or less, former or latter.”<sup>95</sup> In the first way, which considers time as a duration located within a broader tract of imaginary time, it is certainly not

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<sup>91</sup> *Ibid.*, 53: “Ut enim de magnitudine dicebamus: quod sensu dignoscitur, necesse non est secundum omnia, & singula praedicata essentialia discerni, sed sufficit, ut per aliquid, vel secundum aliquid innotescat.”

<sup>92</sup> *Ibid.*, 53: “Cum igitur tempus sit vera duratio, & extensio partium motus, seu forma, per quam ipsae partes extenduntur in ordine ad successionem ad non coexistendum simul, sed una post aliam: negari non potest, ipsum percipi simul cum eiusdem partibus motus.”

<sup>93</sup> *Ibid.*, 53.

<sup>94</sup> *Ibid.*, 53: “Ratio vero a priori est, quia diversimode immutatur sensus a motu, iuxta diversitatem extensionis illius, quae dicitur tempus.”

<sup>95</sup> *Ibid.*, 62, 63.

perceptible by sense.<sup>96</sup> Although if it is considered as “the extension of the parts of motion and a species of quantity” time can “be perceived in some way by sense,” time as duration certainly cannot be.<sup>97</sup> This is because time considered in terms of duration involves both the concepts of its former and latter parts, and the connection and apprehension of these parts, both of which necessarily involve the rational part of the soul. Here, Guevara argued that both the apprehension of duration and our consciousness of its position within the broader tract of imaginary time inevitably involve the intellect. In consequence, the perception of time as a distinct and formal category does not depend on sense-perception.

Nevertheless, Guevara conceded that sense perception is involved when the category *Quando* is considered ‘confusedly and materially’—that is, when time is directly connected to something enduring. Connecting time with a thing that endures in time relates it to the length of its duration, and to its greater or lesser magnitude, “and with the material order of its parts, according as the first are distant from the last, not indeed by comparing the magnitude and its parts one with another, but only by apprehending those parts alone in different ways.”<sup>98</sup> Considered in this way, then, “the cognition of that *Quando* is not to be denied to sense”—that is, it is connected both to internal and to external sense.<sup>99</sup> ‘Sensitive apprehension,’ which Guevara characterized as involving both perception by the external senses and the processing of representations by the internal senses, represents a day and an hour in different ways, just as we apprehend the past, present and future differently. This is the ultimate origin, he suggested, of the Aristotelian connection between the present and sensation, the future and hope, and the past and memory. In addition, Guevara suggested that the apparent awareness of time displayed by many animals also testifies that a confused apprehension of time is

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<sup>96</sup> *Ibid.*, 62: “Nam si sumatur distincte, ac formaliter, prout est forma, seu duratio, quae res constituantur in hoc, aut illo spatio temporis imaginarii; nulli dubium est, ipsum *Quando*, sensum omnem penitus praeterire. Nam licet tempus, prout est extensio partium motus, ac species quantitatis, aliquo modo percipiatur a sensu, tamen prout est duratio eiusdem motus, qua ille constituitur in hac illa differentia temporis imaginarii, nullo modo percipi potest.”

<sup>97</sup> *Ibid.*, 62.

<sup>98</sup> *Ibid.*, 63: “Si vero ipsum *Quando* sumatur confuse, & materialiter simul cum re durante, prout magis, vel minus durat, prius, aut posterius: eo modo quo percipitur magnitudo, magis vel minus extensa, & cum ordine materiali suarum partium, prout primae distant ab ultimis, non quippe conferendo magnitudinem, aut partes illius unam cum altera, sed diversimode tantum illas apprehendendo.”

<sup>99</sup> *Ibid.*, 63.

possible through sense-perception. Here he cited examples of ants, apes and other beasts who, despite their sub-rational status, appear aware of the correct time to store food, and when to sleep. These animal anecdotes may not demonstrate conclusively that time is perceived directly through the senses, but they do indicate that “those permanent things are conceived of as coexisting with the motions themselves, with which they are apprehended to endure materially, and confusedly, as through a day, or an hour, which is to perceive duration confusedly.”<sup>100</sup> In comparison to its apprehension by the intellect, the sense-perception of time in terms of the predicate *Quando* may be imperfect and confused, but Guevara confirms that it is nonetheless possible.

The significance of Guevara’s discussion of time and sense-perception lies in its extensive, sustained nature. It shows clearly that the argument that time might be perceived by sense was a coherent and serious position within the late Aristotelian tradition. Arguments like this never sought to supplant the more familiar Aristotelian model, in which the intellect was the chief faculty involved in the perception of time, but they did offer a more differentiated picture. Guevara’s examination of the possibility of sensitive awareness of time should also be read in the context of discussions in other early seventeenth-century textbooks of the contribution made by non-rational mental faculties to our awareness of time. These included not only the consideration given by textbook authors such as Timpler, Keckermann and Eustachius a Sancto Paulo to connections between time and the imagination, and their arguments that imaginary time is really *imagined*, but also the attention paid to the relationship between time and other internal senses. For example, the discussion of *phantasia* in Otto Casmann’s philosophy textbook distinguished different *phantasmata* or *idola* according to the past, present or future parts of time they represent.<sup>101</sup> In a similar vein, and arguing against the Greek commentator Themistius, the Coimbra *De Anima* commentary accepted that *phantasia* can form an image of time itself.<sup>102</sup> A common trajectory

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<sup>100</sup> *Ibid.*, 63: “Quae licet immediate non arguant, nisi cognitionem temporis extrinseci respectu rerum permanentium: nihilominus convincunt, etiam ipsas res permanentes concipi tanquam coexistentes cum ipsis motibus, cum quibus materialiter, & in confuso apprehenduntur durare, ut per diem, aut horam, quod est confuse percipere durationem.”

<sup>101</sup> Otto Casmann, *Psychologia anthropologica, sive animae humanae doctrina* (Hanau: Apud Guilielmum Antonium, Impensis P. Fischeri, 1594), 371: “Idola autem illa sunt vel a rebus prasentibus, vel praeteritis concepta, vel a futuris etiam praeconcepta & praevisa.”

<sup>102</sup> Collegium Conimbricense, *In tres libros de Anima*, col. 446: “Theophilus tamen hoc in lib. ad tex.22. ait phantasiam non percipere tempus ipsum, nec rationem praeteriti in

characterized these accounts: they all attempted to extend the role attributed to the non-rational faculties in our awareness of time.

Such discussions of time and internal sense all approached time either as an Aristotelian category or as the number of motion perceived by the mind. But these approaches did not entirely set the boundaries for engagement with this question. Some late Aristotelian discussions also allowed a role for time within sensation itself, by considering whether sensation occurs in time, and whether it operates according to a temporal sequence. At stake here was the question of whether the external senses and the common sense can simultaneously perceive multiple sensible objects, or whether sense-perception occurs consecutively. Since the common-sense operated as a clearinghouse of sense-impressions received from the external senses, as well as comparing different sense-impressions, many authors agreed that multiple sense-impressions must reach it concurrently, whereas the external senses perceive only one sensible at a time. Johannes Magirus' philosophy textbook was typical of late Aristotelian views on time and the operation of the common sense in assuming that the common sense could process several sensible species simultaneously. He argued there that the common sense judges and discriminates between different sense-impressions "many together at the same time, that it takes from those senses."<sup>103</sup>

This level of consensus did not extend to discussions of the external senses. As Hieronymus Dandinus argued, the situation in this case was less clear.<sup>104</sup> Dandinus argued that if several distinct sensibles relate to more than one sense, the external senses cannot perceive them either at once or successively, since each sense is restricted to its proper object.<sup>105</sup> Nevertheless, he allowed that—if it is comparing two sensibles—one

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se, sed res, quae praeterito fuerunt tempore, idemque videtur existimasse Themistius: sed nobis contrarium magis placet, praesertim si de phantasia humana sermo sit, de qua in conclusione loquimur."

<sup>103</sup> Magirus, *Anthropologia*, 486: "Utitur ergo sensus Communis reliquis omnibus sensibus tanquam ministris satellitibus; atque hoc sensum ministerio fretus sentit ille, iudicat & discernit species sensiles: & plures quoque simul uno & eodem tempore, quas arripit ab iis sensibus."

<sup>104</sup> Dandinus, *De corpore animato*, 1222: "Iam de numero unum illud disputetur, an multa sensilia simul possint uno sensu sentiri. Facilis esset responsio, si de interiori sensu loqueremur; quem plurimum exteriorum obiecta simul cognoscere constat, dum ea comparat, & separat unumquodque. At de exteriore dicendum." Toletus also made this point; Toletus, *Commentaria... de Anima*, 118v.

<sup>105</sup> Dandinus, *De corpore animato*, 1222: "Is nec simul nec successive plura cognoscit obiecta, quae ad diversos sensus pertineant. Unius enim est determinati obiecti proprii."

sense can indeed perceive more than one proper sensible simultaneously.<sup>106</sup> As he put it, common experience indicates that “[hearing] distinguishes and hears many men and many sounds in a musical concert.”<sup>107</sup> For Dandinus, the ability of external sense to perceive several sensibles simultaneously was connected to the intellect’s capacity “to understand both form and matter, as they make a union.”<sup>108</sup> These two cases were nevertheless distinct, in that the intellect’s ability to understand two parts of something together relies on *phantasia*, “which cannot form an image of things together unless they are one [that is, unless they are a unity, like matter and form].”<sup>109</sup> For although the external senses might be moved by several present objects simultaneously, producing several actions and passions in the sense-organs, a single act of sense-cognition and judgement subsumes the several concurrent impressions.<sup>110</sup> It was important from Dandinus’ perspective to distinguish the multiplicity of concurrent sense-data and the single act of sensation that comes from it. In addition, he emphasized that, although the external senses can process several sensibles at one time, the impressions produced will be less perfect than if a single sensible were to be perceived in the same amount of time.<sup>111</sup> Dandinus’ discussion emphasized the idea that time could act as a kind of structuring element when analysing sensation: when we examine the concurrent operations of the external senses, he implied, then we also inevitably examine the moment of time in which they occur. He also contrasted this notion of a moment in time with a form of temporal sequence, and distinguished the perception of sensibles ‘together’ or ‘in one moment of time’ (*simul*) from perception that occurred ‘successively’ (*successive*).

The account developed in Dandinus’ commentary and elsewhere of how sense-perception occurs in time or involves a temporal sequence should be contrasted with the attack on this position pressed by Zabarella in his

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<sup>106</sup> *Ibid.*, 1222: “Potest tamen plura simul percipere, ut ea faciunt unum simulque movent sensum. Aspectus, dum album a nigro distinguit, utrumque simul cognoscit.”

<sup>107</sup> *Ibid.*, 1222: “Multos homines simul videt, & auditus multos audit sonos in concentu musico, aut multorum clamore, &c.”

<sup>108</sup> *Ibid.*, 1222: “Intellectus quoque simul materiam & formam intelligit, ut unum faciunt coniunctum; & enuntiatio subiecto constat & attributo; ut alia plura taceam.”

<sup>109</sup> *Ibid.*, 1222: “Tametsi a phantasia is pendeat; quae simul formare nequit nisi unum.”

<sup>110</sup> *Ibid.*, 1222: “Exterior autem sensus a pluribus obiectis praesentibus simul movetur. Ut quamvis plures sint obiectorum actiones in sensum, atque adeo plures in eius organo susceptiones ac passiones: illas tamen unica sequitur cognitio sensus, unicam de omnibus iudicium.”

<sup>111</sup> *Ibid.*, 1222: “Minus tamen perfecte ac distincte singula internoscit, quam si seorsim singula perceperisset. Pluribus quippe intentus minor est ad singula sensus.”

*De Anima* commentary (which was partially reprinted in his *De Rebus Naturalibus*). Here, Zabarella divided the process of sensation into three separate parts, or ‘instants’, which he claimed are “ordered and distinct, if not in time, at least by nature.”<sup>112</sup> Zabarella’s terminology here is significant—the word *instantia* implied not only the familiar Aristotelian notion of an instant, or moment in time, but also endurance or persevering in time. The initial element of the process of perception involves receiving species in the organ of sense, by the action of the material object; the second is a kind of judgement *in toto composito*, in the animated organ; consequently, the soul, as a part of the composite, can be said to undergo change.<sup>113</sup> The first instant can ‘precede the rest in time’, but the second cannot precede the third instant in time, only ‘by nature,’ because “vision is at once a judgement or action of the soul, and a passion of the animated eye, (just) as the form of an element is at the same time a mover insofar as it is a form, and a moved thing insofar as it is matter; so that the action belongs solely to the soul, whereas the passion is not only of the soul but of the animated organ.”<sup>114</sup> Therefore in Zabarella’s terms, the nature of sensation cannot be utterly temporal—it does not follow a strict temporal sequence.

The wider context of debates on the temporality of thought and cognition informed these discussions about the temporal nature of sensation. Zabarella, like Johannes Magirus and the other central European authors influenced by Zabarella, also rejected the notion that intellection involved any transition from former to latter, or, consequently, any reference to a concept of time. Admittedly, neither Zabarella nor any of these other authors presented a developed account of the temporal component of sensation. However, despite this, they emphasized that if we wish to say

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<sup>112</sup> Iacopo Zabarella, *Commentarii... in iiii Aristotelis libros de Anima* (Frankfurt: Sumpibus Lazari Zetzneri, 1606), col. 527: “Ex his omnibus colligimus tria haec in sensione notanda esse, quae Latini tria instantia appellantur, ordinata, atque distincta, si non tempore, saltem natura.”

<sup>113</sup> *Ibid.*, col. 527: “... primum enim ab actione obiecti materialis sit in organo receptio speciei, ut coloris in oculo; secundo anima iudicium in toto composito, nempe organo animato, & ita anima tanquam eius pars dicitur pati...”

<sup>114</sup> *Ibid.*, col. 527: “... primum quidem instans potest etiam tempore praecedere reliqua, ut diximus de illo, qui res praesentes non animadvertisit, potest etiam non praecedere tempore, sed solum natura, at secundum non potest praecedere tertium tempore, sed natura tantum praecedit, quia visio est simul iudicatio, seu actio animae, & receptio oculi animati, quemadmodum simul tempore forma elementi est movens quatenus est forma, & mota quatenus est in materia, ita ut agere sit solius animae, pati autem non solius, sed organi animati...”

that time is perceived by sense, this perception should be seen as the action of a faculty that also operates in time.

### *Time and Sensitive Memory*

Of all the aspects of the sensitive soul, memory was the most closely associated with notions of time and the temporal world. Unlike in discussions of sensation and the intellect, the central role of time in memory was never questioned by late Aristotelian authors. Instead, they paid particular attention to the concept of sensitive memory as a *temporal* sense. In Aristotelian psychology, memory was considered a temporal sense not because it sensed time, but because it recorded and stored past sense-impressions. It did this, as Magirus put it, "with the distinction and addition of past time (*cum differentia & additione temporis praeteriti*)."<sup>115</sup> The power of memory therefore distinguished different species according to their temporal status. Unlike *phantasia*, the other main internal sense, memory dealt with objects that are absent because they are past, and was common to man and animals. Reminiscence, on the other hand, consisted of a kind of discourse performed by the rational soul in order to reconstruct the remembered impressions, which was particular to man.

Discussions of memory in late sixteenth- and early-seventeenth-century psychology and natural philosophy were diverse and fertile. Memory was discussed in terms of its psychology and physiology and also in terms of specific memory techniques. The improvement or 'augmentation' of memory was a popular theme, particularly in medical literature. Treatments of the techniques of memory were based on common assumptions about the nature, structure and operation of memory as an internal sense that derived from the *De anima* and *Parva naturalia* commentary traditions. Commentaries on the *Parva Naturalia* and specifically on Aristotle's *De Memoria et Reminiscencia* were less common in this period than those on *De Anima*, partly because of assumptions about the lesser philosophical sophistication of this work: certainly, more exegetical effort was directed towards the complex problems of *De Anima*. Consequently, in the textbook tradition and in many commentaries the topic of memory was commonly bundled together with material on the soul from *De Anima*. I want to suggest that much of the importance accorded to it can be explained by its role as the pre-eminently *temporal* internal sense.

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<sup>115</sup> Magirus, *Anthropologia*, 487.

The most fundamental question posed about memory as a temporal sense concerned its temporal orientation. Late renaissance Aristotelians commonly asked whether the sensitive soul can remember present or future things. In many cases the context of this question was the theological debate about commemoration and real presence. When Otto Casmann, for example, asked “Whether memory is only of past things”, one of his counter-arguments concerned the memory of present things and particularly of God:

You object, that we nevertheless say that we remember God as most present. I respond, that we remember God not as present (although we recognise that he is present to us) but by reason of something that is past, that is, we remember God in respect of the past of his promises, deeds, testaments and by the argument of his power and will towards us, that we formerly knew and experienced.<sup>116</sup>

It seems that the theological dimension was the motivating factor here: Casmann addressed the temporal orientation of memory to counter those who oriented memory towards the present on account of our commemoration of God.

The German Catholic theologian and natural philosopher Christoph Scheibler's *Liber de Anima* (1627) also considered the religious implications of the temporal orientation of sensitive memory, arguing that “The Calvinists abuse this doctrine, who, when they hear that memory is of past things, conclude that the body of Christ cannot be present in the Eucharist.”<sup>117</sup> Scheibler rejected this argument, concluding firstly that “in the Eucharist the memory of the passion of Christ is equally said to be instituted,” but that passion is entirely past.<sup>118</sup> Secondly, “the thing itself, whose past action is commemorated, can be present or absent without

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<sup>116</sup> Casmann, *Psychologia anthropologica*, 384: “Obiicis: Dei tamen praesentissimi dicimus meminisse. Resp Recordamur Dei non qua praesens (licet praesentem eum nobis agnoscimus) sed ratione alicujus praeteriti, hoc est, recordamur Dei respectu praeteritu ejus promissionum, factorum, testimonium & argumentum potentiae & voluntatis eius erga nos, quae olim cognovimus & experti sumus.”

<sup>117</sup> Scheibler, *Liber de anima*, 241: “Abutuntur hac doctrina Calviniani, qui cum audiunt memoriam esse praeteritorum, concludunt Corpus Christi non posse praesens in coena.” See Caspar Bartholin, *Enchiridion physicum ex priscis et recentioribus philosophis accurate coccinatum, et controversiis naturalibus potissimis, utilissimisque illustratum* (Strasbourg: Sumptibus Eberhardi Zetzneri, 1625), 810.

<sup>118</sup> Scheibler, *Liber de anima*, 241: “... in coena institui memoriam passionis Domini juxta dictum: mortem Domini annunciatibus donec veniat I Cor II v 27 quae passio omnino praeterita est.”

difficulty.<sup>119</sup> Its presence or absence does not affect our ability to remember it. Scheibler, who also wrote a theological polemic on the Eucharist, used the temporality of memory to reject Calvinist arguments about real presence and transubstantiation.

For some northern European textbook authors, the temporal orientation of memory also raised questions about its status as an internal sense. Following Zabarella, these authors questioned whether memory's role in recording and storing past sense-impressions implied that it lacks the necessary cognitive component of sense. In his commentary on *De Anima* and his *De Rebus naturalibus*, Zabarella argued that "because the name of sense seems to denote cognition, memory is not truly cognitive, but only a conservator of images... therefore there is a doubt about whether it is proper to call memory a sense."<sup>120</sup> As memory does not receive species, but only stores them, it cannot be said to participate in cognition in the same way as the external senses. This is because "by itself memory does not have the power of cognition, nor must it have it, on account of the fact that a cognitive faculty cannot receive species without cognition, for the reception of species is nothing other than cognition itself."<sup>121</sup> Also, "many things cannot be cognized at the same time, therefore a faculty that is able to receive many species at once ought to lack cognition; but nevertheless it serves cognition, and so far for this reason can be called cognitive."<sup>122</sup> Memory preserves many images at the same time, and this ability to process several species concurrently separates it from sense. Nevertheless, it can be said to "have the function of serving cognition."<sup>123</sup> In a sense, Zabarella argued that the involvement of time, and particularly of the duration of species in memory, distinguishes it from other senses.

Zabarella's argument was adopted by many northern European textbook authors, including Magirus, Otto Casmann, Christoph Scheibler

<sup>119</sup> *Ibid.*, 241: "Res ipsa, cuius praeterita actio commemoratur, potest abesse vel adesse sine incommodo."

<sup>120</sup> Zabarella, *Commentarii... de anima*, col. 404: "... sed quia nomen sensus cognitionem denotare videtur, memoria vere non est cognoscitiva, sed solum conservativa imaginum... ideo dubium est an memoriam liceat sensum appellare."

<sup>121</sup> *Ibid.*, col. 405: "... sed ipsa per se memoria vim cognoscendi non habet, neque habere debuit, propterea quod facultas cognoscitiva non potest sine cognitione recipere speciem, species enim recepta nil aliud est, quam cognitio ipsa..."

<sup>122</sup> *Ibid.*, col. 405: "... plura autem simul cognosci minime possunt, ideo facultatem illam quae plura simul retinere apta esset, cognitione carere oportuit, immediate tamen inservire cognitioni, & hac tantum ratione posse appellari cognoscitivam..."

<sup>123</sup> *Ibid.*, cols. 408–9: "... licet enim memoria non sit cognoscitiva, nullum tamen aliud habet officium, quam inserviendi cognitioni..."

and Bartholomaeus Keckermann. In his discussion of Melanchthon's *De Anima* commentary, *Anthropologia* (1603), Magirus followed a similar line of argument to Zabarella, although he placed less emphasis on the need for a cognitive element in sense, suggesting that

Not only that which perceives and knows sensibles, but also that which contributes something to sensation, must be called a sense. But, by conserving sensible species, memory contributes to sensation: indeed this conservation is equally necessary as judgement. But nor is it wholly divorced from the faculty of perceiving: because unless it received images and species it could not conserve them.<sup>124</sup>

Magirus was far less willing than Zabarella to deny the features and functions of sense to memory, since he attributed some cognitive power to memory. Otto Casmann's *Psychologia Anthropologica* (1594) also discussed whether memory is a sense in a polemic against the French physician Jacques Aubert, although the influence of Zabarella on his discussion is clear. Casmann was more ready than Magirus to concede the distinctive nature of memory, and the way in which its temporal orientation and role as a conservator of species separate it from the external senses. Memory, he argued, does not perceive or cognize its sensibles, but instead receives them from their particular sensitive faculties.<sup>125</sup> Moreover, Casmann emphasized the role of time in distinguishing memory, which "does not indeed know things in themselves, but with the circumstance of time, because they had been perceived by sense at some time, not because it perceives time formally, but accidentally, that is, it knows that thing in the circumstance in which it had formerly been sensed and estimated."<sup>126</sup> Memory, as a 'conserving' sense, Casmann suggested, was distinguished from the other, cognitive senses by the 'circumstance' of time.<sup>127</sup> By extension, time must also be what distinguishes the intellectual memory of universals from sensitive memory. When the soul remembers an object as

<sup>124</sup> Magirus, *Anthropologia*, 622: "Sensus non simpliciter is debet dici, qui percipit & cognoscit sensilia: sed etiam qui aliquid confert ad sensationem. At memoria conservando species sensiles facit ad sensorium: quae quidem conservatio aequa est necessaria, atque ipsa dijudicatio. Sed nec prorsus destituitur facultate percipiendi: quia nisi acciperet imagines & species: easdem conservare non posset."

<sup>125</sup> Casmann, *Psychologia anthropologica*, 383: "Memoria non percipit, cognoscit & apprehendit sua sensilia, ut sensus reliqui, sed pro sibi data facultate propria."

<sup>126</sup> *Ibid.*, 383: "Non quidem in se res cognoscit, sed cum circumstantia temporis, quod fuerint aliquando sensu perceptae, non quod tempus formaliter percipiat, sed accidentaliter, id est, cognoscit rem hac in circumstantia, quod olim fuerit sensa & aestimata."

<sup>127</sup> *Ibid.*, 383: "...proinde nos hunc conservationis sensum a cognitionis sensibus distinximus."

past, it has an accidental awareness of that object in a particular time, rather than a broader knowledge of the time in which the object existed, which, according to Casmann, would depend on sense and the intellect.

Bartholomaeus Keckermann addressed Zabarella's argument about the status of memory as a sense by widening his definition of the functions of sense, arguing that "The conservation of sensible species is not the first (aspect) of sense, called primary: however, it can be a sense arising from the first, and called secondary."<sup>128</sup> More importantly, he suggested,

memory is not only a bare conservation of sensible species, but is also the giving back of conserved species; yet that conservation indeed includes some reception, which follows from this: because someone who wants to commit something to memory should first imprint it in memory: or, as we say, he should first retain it, then conserve it, and finally when he needs it, bring it back from memory.<sup>129</sup>

These debates addressed the cognitive status of memory, but authors such as Casmann also made it clear that the specific temporal orientation of memory towards the past is an important factor in distinguishing it from the external senses.

Distinguishing memory from the other internal senses also concerned some authors. Some late renaissance commentators questioned whether the role of memory in preserving past sensible images, and indeed its general orientation towards the past, was shared with the other internal senses, and particularly with *phantasia* and *aestimativa*. This debate should be seen in the context of the more general move in late renaissance Aristotelianism to expand the number of mental faculties connected to time. Gutierrez de Godoy, for example, questioned whether imagination and *aestimativa* also conserve species.<sup>130</sup> He noted that because memory takes a universal role in conserving *all* species, and because the imagination is moved directly by the external senses without the need for intermediate species, it seems that species in the imagination are superfluous, but Galen, Aristotle and a range of later commentators nevertheless argue for

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<sup>128</sup> Keckermann, *Operum omnium... tomus primus*, col. 1525: "Conservatio specierum sensibilium non est sensus primus, primarius dictus: potest autem esse sensus ortus a primo, & secundario dictus."

<sup>129</sup> *Ibid.*, col. 1525: "...memoria non est nuda tantum conservatio specierum sensilium, sed etiam est redditio specierum conservatarum; imo ista conservatio includit quandam receptionem, quod inde patet, quia qui memoriae aliquid mandare vult, eum oportet id prius imprimere memoriae; sive, ut loquimur, oportet eum prius retinere, deinde conservare, & denique cum opus est, reddere ex memoria."

<sup>130</sup> Gutierrez de Godoy, *Disputationes phylosophicae, ac medicinae*, 45r.

imaginative species.<sup>131</sup> This is because “animals do not just know present objects with their internal senses, by which they are actively affected, but also absent objects, by which they can in no way be affected.”<sup>132</sup> Therefore, “it is necessary to assign a beginning or principle, by which interior sense is determined to such a cognition: however this can be nothing other than impressed species (*species impressa*). Therefore (*phantasia*) necessarily conserves impressed species.”<sup>133</sup> He concluded that “if memory preserves species of things, nevertheless it is not at all superfluous to constitute species in the imagination, on account of the different way by which they represent: for the species of memory represent past objects as past: but imaginative species represent them solely as absent, or present.”<sup>134</sup> Gutierrez de Godoy distinguished between the temporal nature of the preservation of species performed by memory, and the atemporal operation of *phantasia*: interestingly, he also argued that absent objects are not absent in time.

Gutierrez de Godoy’s discussion of *aestimativa* focused more closely on the concept of time. He again asked if *aestimativa* preserves non-sensible species (that is, those produced by the internal senses) separately from memory. He recognised that attributing this power of temporal preservation to *aestimativa* would make many of the attributes commonly associated with memory superfluous. For example, if *aestimativa* were to preserve non-sensible species, “it would necessarily know such an object along with distinction of past time and place.”<sup>135</sup> A sheep that recognises the figure of a wolf has an insensible image of that wolf, or an ‘estimation’ of it. But this image, “if it were preserved in *aestimativa*, would suggest to this power the place and time in which the wolf was known.”<sup>136</sup> However, such an image would not be distinct from a memory of the wolf,

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<sup>131</sup> *Ibid.*, 45r–v.

<sup>132</sup> *Ibid.*, 47r: “quia animalia sensu interiori, non solum cognoscunt obiecta praesentia, a quibus actu immutantur; sed etiam absentia, a quibus nulla ratione possunt moveri.”

<sup>133</sup> *Ibid.*, 47r: “Ergo necessario assignandum est principium, a quo sensus interior determinetur ad talem cognitionem: hoc autem nullum alium esse potest nisi species impressa.”

<sup>134</sup> *Ibid.*, 47r: “Ad secundum respondetur, etiam si memoria conservet species rerum minime tamen supervacaneum esse constituere species in imaginativa propter diversum modum, quo illae representant; nam species memoriae representant obiecta praeterita ut praeterita; imaginativae vero solum representant illa ut absentia, aut praesentia.”

<sup>135</sup> *Ibid.*, 48r: “Praeterea, si aestimativa conservat species insensatas, quando cum illis operatur in absentia obiectorum, necessario cognoscit talia obiecta cum differentia temporis praeteriti, & loci.”

<sup>136</sup> *Ibid.*, 48r: “Ergo haec eadem species si servetur in aestimativa suggesteret huic potentiae locum, & tempus, in quo lupus cognitus fuit.”

since an image stored together with an awareness of its time and place is nothing other than a memory. Gutierrez de Godoy argued that there is little evidence to suggest that *aestimativa* involves such an awareness of time and place, or that it preserves insensible species separately from sensitive memory. The Alcalá commentator engaged in a similar debate, questioning whether memory or *aestimativa* are distinct mental powers. He concluded that they do differ, because *aestimativa* perceives insensible species as present, whereas memory preserves them as absent in time.<sup>137</sup> To a great extent, these debates on sensitive memory focused on the notion that its particular concern with temporal objects distinguishes it from other mental powers. However, unlike accounts of intellectual memory, these debates were not concerned with notions of the individual subject locating itself in time, which perhaps reflects the division in Aristotelian psychology between the intellectual and the sensitive soul.

### *Animal Souls and the 'Sense of Time'*

Discussions of the soul which connected memory to the past implied not only that it was a temporal sense, but also that it must involve some awareness of time itself. It was also assumed that memory's status as a temporal sense demonstrates that non-rational elements of the soul—distinct from the intellect—engage with time. The ability of these non-rational mental faculties to engage with time was often discussed in terms of a 'sense of time' (*sensus temporis*). Many commentators insisted that humans possess a 'sense of time' that stems from their rational nature, and which separates them from other animals, who at most exhibit an imperfect awareness of time. However, certain problems were implicit in this argument, both because it was universally agreed that sensitive memory was located in the sensitive soul, and because experience indicated that memory and an awareness of the past were characteristics evident in many other animals. Arguing that animals can perceive time involved challenging the connection established between time and the intellect in contemporary *Physics* commentaries. To make this argument commonly involved drawing on the more complex accounts of time-perception which emerged in the *De Anima* tradition. In this vein, a number of commentators attempted to

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<sup>137</sup> Collegium Complutense, *Disputationes... de Anima*, 405.

reconcile the non-rational status of animals with the ‘sense of time’ they plainly exhibited. According to Antonio Scaynus, Aristotle believed

memory is only in those animals that sense time. Where it must be perceived, that some animals presage that something will happen by natural instinct; as, for instance, with rain, as in those who are moved by the kind of motion from which, by a certain experience, we make a judgement that there will be rain. Truly Aristotle’s words that some animals sense time must be understood otherwise, that is to say insofar as they have a present [sense] of things done in time, as when they recall their past now. Just as the ass, who fell in a ditch, passing by it a second time avoids it because of the fall it had already suffered.<sup>138</sup>

The sagacious ass which shuns the scene of its previous misfortune shows both that it remembers and that it draws on this memory to plan future actions. However, Scaynus insisted that this kind of temporal awareness was distinct from the knowledge of time that humans could achieve. Moreover, “It must not be said, that an irrational animal knows time properly, as man does: but it senses time by accident (*per accidens*) insofar as it recognises the things itself that occur in time: whence it is said to remember.”<sup>139</sup> The memory and awareness of the past displayed by the ass does not constitute knowledge of time itself, but rather an appreciation of objects under the condition of past time. This distinguishes the animal’s engagement with time from that displayed by humans, since man’s rational soul gives him awareness of the future. Moreover, “man perceives that he remembers, which is forbidden to beasts, who only record and also do not perceive that they are engaged in the act of remembering.”<sup>140</sup> Humans can be distinguished from the other animals not only by the superior temporal awareness that underpins their memory, but also by their ability to reflect upon that memory. Scaynus therefore concluded that, when avoiding the

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<sup>138</sup> Scaynus, *Paraphrasis*, 60: “Consequenter ad dicta infert, memoriam illius inesse animalibus solum, quae tempus sentiunt. Ubi advertendum, nonnulla animalia praesentire naturali instinctu aliquid futurum; veluti pluvia, ut quae tali motu agitentur, ex quo experientia quadam iudicium sumimus, q sit futura pluvia. Verum aliter intelligendum est dictum Aristotelis, quod sentiunt nonnulla animalia tempus, quatenus scilicet rei factae in tempore habent in promptu, ut eius iam praeteritiae recordentur. Quemadmodum asinus, qui in quandam foveam inciderit, illae iterum pertransiens illam evitat, memor casus iam perpessi.”

<sup>139</sup> *Ibid.*, 60: “Non autem dicendum, quod animal irrationale proprie cognoscat tempus, ut homo: sed per accidens sentit tempus, quatenus; quod ipsi eviterit, in tempore recognoscit; unde id memorare dicitur.”

<sup>140</sup> *Ibid.*, 60: “Praeterea homo percipit se recordari; quod vettitu est brutis; quae solum recordantur; non autem advertunt, quod in opere memorandi versentur.”

ill-fated ditch, the ass displays a form of instinctive avoidance resembling *aestimativa*, rather than genuine consciousness of the future.

The question of animals' awareness of time was also treated at length in the Coimbra commentary on Aristotle's *Parva Naturalia*. The Coimbra commentator located the question of animal memory and the role of a sense of time in memory within its zoological context. He began by considering which animals might lack memory, setting this question within the broader issue of sense-perception in animals: 'imperfect' or simple animals like sea molluscs, which do not possess many of the superior senses, and which cannot move themselves, are also unlikely to possess memory.<sup>141</sup> Self-moving animals (those which are capable of locomotion) are therefore also likely to possess memory, although for the Coimbra commentator this argument was not sufficient.<sup>142</sup> Place, as well as time, therefore featured significantly in late Aristotelian treatments of memory. Nevertheless, the Coimbra commentary emphasized that animals remember locations where they previously existed in relation to the *time* at which they were there.

The relationship between temporal awareness and memory was typically understood in the context of broader issues concerning the status of memory as a mental power. The discussions of the 'sense of time' examined here put memory within the sensitive soul, but also related it to the soul's ability to perceive time. Johannes Magirus' natural philosophy textbook made this connection when he argued that "We do not perceive and know anything that pertains to the sensitive faculty of the soul, without time. But (when) we remember something, we do not remember without time."<sup>143</sup> For Magirus, magnitude was one form of this kind of perception with time, "We perceive magnitude in whatever way that we also perceive time and motion, since there can be no motion without magnitude and no time without motion."<sup>144</sup> We perceive magnitude as a common sensible,

<sup>141</sup> Collegium Conimbricense, *Commentarii Collegii Conimbricensis Societatis Iesu, in quatuor libros de Caelo, Metereologicos & Parva Naturalia Aristotelis Stagiritae* (Cologne: Sumptibus Haeredum Lazari Zetzneri, 1631), cols. 6–7.

<sup>142</sup> *Ibid.*, col. 7.

<sup>143</sup> Magirus, *Physiologiae peripateticae*, 359: "Quaecunque non sine tempore percipimus & cognoscimus, ea ad sentientem animae facultatem pertinent. At quaecunque meminimus, non sine tempore meminimus, ut ante probatum est."

<sup>144</sup> *Ibid.*, 359: "Quocunque percipimus magnitudinem, eo quoque percipimus tempus & motum, siquidem nullus motus sine magnitudine & nullus tempus sine motu esse potest."

through the common sense—time is perceived in the same manner.<sup>145</sup> Magirus essentially approached this question in terms of the psychology of time perception: he argued that time is perceived by the common sense, and because all acts of perception involve time, time perception must be located in the sensitive soul. His argument that a ‘sense of time’ was a prerequisite of memory therefore invoked the sensitive soul more explicitly than those of other late Aristotelian authors. In many respects, Magirus based his account of memory on an account of time-perception; consequently, he also needed to draw on assumptions about how time relates to the internal and external senses, instead of emphasizing only the connection between time and the intellect.

Notions of a *sensus temporis* were also commonly connected to questions of motivation and of our ability to orient ourselves in time. These discussions were provoked by *De Anima* III.6 433b 5–10, which observed that,

appetites may conflict, and this happens wherever reason and desire are opposed, and this occurs in creatures which have a sense of time (for the mind advises us to resist with a view to the future while desire only looks to the present: for what is momentarily pleasant seems to be absolutely pleasant and absolutely good, because desire cannot look to the future).<sup>146</sup>

Late renaissance commentators typically read this passage as an account of the conflict between the rational appetite, or will, and the sensitive appetites, or passions, but also as a discussion of what constitutes an awareness of time, and of who might possess it. As a result, for them it also invoked significant questions about the role of sensation in the perception of time.

Aristotle’s original account emphasized that the ‘sense of time’ means that man can postpone or shun immediate gratification in favour of potential future benefits. The conflict between rational and sensitive appetites that he described exists in animals who are aware of time because it is this awareness that produces a rejection of present pleasures. Admittedly, some commentators did little more than assert that man, who is the only animal with a rational soul, must also be the only animal possessed of

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<sup>145</sup> *Ibid.*, 359: “Atqui magnitudinem percipimus sensu communi. Ergo tempus etiam percipimus.”

<sup>146</sup> Aristotle, *On the Soul: Parva Naturalia: On Breath*, transl. W. S. Hett (Cambridge, MA: Harvard University Press, 1936), 189.

a true sense of time.<sup>147</sup> Another common line of interpretation was to emphasize the passage's clear moral overtones, since the human intellect ultimately weighs the risk of future damnation over present, and fleeting, sensual pleasure.<sup>148</sup> A typical commentary of this kind was that of Augustinus Faba, who glossed this passage using the example of adultery, noting that,

the intellect knows it to be evil for a married man to have relations with other women, on account that a grave sin is committed, and knows that he will suffer punishment after death on account of his sin. And then the intellectual appetite commands the man that he should relinquish the other women, knowing of the future detriment: but sense, which does not perceive future time, and only judges present things, commands men to have relations with other women.<sup>149</sup>

Faba's overall message was that the problem in this case is as much temporal as moral, since he argued that Aristotle "teaches that the aforementioned appetites are in conflict amongst themselves on account of time."

Other late Aristotelian authors, influenced in part by the Greek commentary tradition, suggested that *De Anima* III.6 433b 5–10 is in fact less clear than it appears. In particular, Antonio Scaynus and Hieronymus Dandinus argued both that the notion of a 'sense of time' derived from the human intellect is rather opaque, and that it may not even be unique to man. Scaynus' 1599 *De Anima* commentary interpreted the phrase "those who have a sense of time" as "those who know time, and consider it according to present, past and future."<sup>150</sup> Scaynus was strongly influenced by the Hellenistic commentary tradition, and cited the arguments of John Grammaticus (that is, pseudo-John Philoponus) and Themistius against Aristotle's identification of a sense of time as a solely human

<sup>147</sup> E.g. Johannes Baptista Rubeus, *Commentaria dilucida in tres libros Aristotelis de Anima* (Venice: Apud Ioannem Guerilium, 1602), 80.

<sup>148</sup> Toletus, *Commentaria... de Anima*, 172v; Antonius Polus, *Novum Veritatis Lumen in Tres Libros Aristotelis de Anima* (Venice: Apud Simonem Galignanum, 1578), 264.

<sup>149</sup> Augustinus Faba, *In tres Aristotelis libros de Anima praclarissima commentaria* (Seville: Apud Virgilium de Zagrandis, 1596), cols. 812–3: "Docet praedictos appetitus esse inter se contrarios propter tempus: nam (exempli gratia) intellectus cognoscit malum esse, virum nuptum cum aliis mulieribus rem habere, ob grave quod committitur peccatum, & scit se passurum poenas post mortem, eius peccati causa. Tuncque appetitus intellectivus praecipit homini ut reliquas mulieres relinquat, praecognito futuro detimento: sed sensus, qui futurum tempus non percipit, & solum de praesentibus iudicat, praecipit homini ut cum aliis mulieribus rem habeant."

<sup>150</sup> Scaynus, *Paraphrasis*, 144: "Sit inquit bellum hoc inter contrarios appetitiones quod eos, qui habent temporis sensum; qui cognoscunt tempus, & illud meditantur secundum praesens, praeteritum & futurum."

characteristic. It can be argued, he implied, that temporal awareness may not be limited to man, since ants and storks also show an awareness of time when they store food for the winter or migrate to sunnier climates.<sup>151</sup> Also, Scaynus suggested, a lion who was wounded whilst attacking a herd of cattle and now will not attack them again shows an awareness of the past injury and its potential future consequences.<sup>152</sup>

However, Scaynus argued that these examples of animal temporal awareness do not entirely undermine the link between humanity and temporality. For the ant and the stork, “do not apprehend the nature of time, but those things that are in time, as cold, heat and the suchlike: but ants gather some provisions by natural instinct, without consideration of the predicate of time.”<sup>153</sup> Scaynus paraphrased John Grammaticus, arguing that “some animals have an indefinite sense of time, as they sense winter, or summer, but not definite time, such as days, and hours, which they number as man does, since to number is particular only to the rational soul.”<sup>154</sup> The implication was not so much that animals emulate man’s awareness of time, but that they possess their own imperfect, indefinite form of the ‘sense of time’. There is some ambiguity, however, over what form this awareness takes in non-rational animals.

Scaynus also tackled the problems inherent in the idea of a ‘sense’ of time, which, according to *Physics* IV, must really depend on the intellect. For him, the phrase “in those who have a sense of time, neither means that man senses time, since we do not see that thing, and neither therefore that we imagine it.”<sup>155</sup> Instead, “by sense, it is to be understood from Aristotle the awareness (*notitia*) that is had of time.”<sup>156</sup> Scaynus interpreted the ‘sense of time’ essentially as a cognitive grasp of time that is directed by reason. He sided with Themistius against Alexander of Aphrodisias here, arguing that although the human mind plays a role in measuring time, and also in sensing the motion upon which it is based, it does not

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<sup>151</sup> *Ibid.*, 144.

<sup>152</sup> *Ibid.*, 144.

<sup>153</sup> *Ibid.*, 144: “Nam dicimus, quod haec animalia non apprehendunt temporis naturam; sed quae sunt in tempore, ut frigus, calorem, & huiusmodi: formicae vero instinctu quodam naturali congregant annonum, absque praedicta temporis meditatione.”

<sup>154</sup> *Ibid.*, 144: “Dicit enim Ioan Gram quod aliqua animalia habent temporis sensum indefinite, ut sentiunt hymem, vel aestate; non tempus definitum, nempe dies & horas, quas numerent, ut homo facit; cum sit proprium solius animae rationalis numerare.”

<sup>155</sup> *Ibid.*, 144: “...in his quae habent sensum temporis, censet quod neque homo sentiat tempus, quoniam ipsum non videmus, ergo neque imaginamur.”

<sup>156</sup> *Ibid.*, 144: “Dicendum ex adverso per sensum, intelligi ab Aristotele notitiam, qua habetur de tempore.”

create time.<sup>157</sup> In rejecting an entirely psychological model of time, Scaynus accepted the arguments advanced by many early modern commentators on the *Physics*, but he also expanded their approach by considering the connections between sensation and time.

One of the most extensive and thoughtful discussions of the ‘sense of time’ in the early modern commentary tradition came in Dandinus’ *De Corpore Animato*. In several respects, his approach was consonant with that of Scaynus, identifying two ‘grave difficulties’ in the passage: first, “whether only man has a sense of time,” and second whether humans are the only animals in whom contrary appetites contend.<sup>158</sup> In the case of the first difficulty, he noted, “Surely not only man, but also very many beasts lacking intellect and reason have a sense of time...?”<sup>159</sup> Dandinus also cited the example of the stork and the ants from the Greek commentaries. More interestingly, he developed Themistius’ refutation of Alexander’s psychological account of time into a discussion of the ontology and reality of time, in an attempt to reconcile the model of time in *Physics* IV with that suggested by *De Anima* III.6 433b5–10. Time in Dandinus’ account is the duration of motion, which “must surely exist in the thing itself no less than motion,” and “nor does it need the thought or supposition of the soul, just as the other species of duration, eternity and *aevum*, do not.”<sup>160</sup> Dandinus argued that the numbering of the successive parts of motion into time must be a work of the intellect alone, although the number itself depends on the motion that is numbered.<sup>161</sup>

In a similar way to Scaynus, Dandinus approached the question of whether animals possess a genuine awareness of time through the Greek commentary tradition. Here he drew heavily on Philoponus’ distinction between animals’ imperfect cognition of time, and the perfect numbering of motion of which only man is capable. In his view, animals “do not apprehend time, but those things that are in time, such as cold or heat,

<sup>157</sup> *Ibid.*, 144: “Sed homo habet etiam sensum temporis, cum sentiat motum, unde tempus constituitur. Them hoc loco reprehendit Alexandrum, qui dixerit, ab homine creari tempus. At pro Alexandro dici potest, quod nisi homi mensuret motum utique non adesset tempus; unde quodam modo homo creat tempus, non motum; sed eius mensuram meditans, constituit tempus, quod constituit in mensura motus.”

<sup>158</sup> Dandinus, *De Corpore Animato*, 2188.

<sup>159</sup> *Ibid.*, 2188: “Sane non solum hominem, sed bestias quoque plerasque intellectus & ratione carentes temporis sensum habere...”

<sup>160</sup> *Ibid.*, 2189: “Verum si tempus durationem motus significat, ea sane non minus, quam motus, in rebus ipsis existit; neque animae cogitatione aut supputatione opus habet, sicut nec caeterae durationis species, aeternitas, & *aevum*.”

<sup>161</sup> *Ibid.*, 2189.

the former of winter and the latter of summer.”<sup>162</sup> Dandinus also argued that time is inaccessible to sense and *phantasia*, which deal with corporeal and sensible things, because of its incorporeal nature.<sup>163</sup> As the intellect is the only power of the soul that can number and distinguish time definitely, only man can possess might be termed a *definite* sense of time. It is important to recognize that, for Dandinus, this did not necessarily mean that a ‘sense of time’ is unique to man.<sup>164</sup> Instead, he argued—after Themistius—that the appetites are in conflict in all those animals with a sense of time, “and in man most powerfully.” He drew on the distinction he had already established between time’s incorporeal nature and the sensible, corporeal objects that are located in time, to argue that animals sense time “from its accidents,” “inasmuch as they do not properly have a sense of time itself, but of the motion and passion of that which they have received at some time.”<sup>165</sup> Man, on the other hand, “senses time in itself.” Whilst it is clear that animals recognize the substrate of time—motion—they nevertheless lack the capacity to number that motion as time. Dandinus is less clear on whether their grasp of objects and motions in time represents a knowledge of the accidents of time, however, since time is itself an accident of motion.

All of these discussions should be understood within wider early modern debates about the mental capacities of animals. Many readers of *De Anima* and *Parva Naturalia* considered whether animals might possess imagination—or even reason.<sup>166</sup> The consensus amongst authors within the Aristotelian tradition was that, although reason is unique to man, the natural instinct possessed by higher animals (and in particular by those termed *bruta*) may allow them to display rational characteristics. For instance, Franciscus Toletus openly questioned whether prudence—originating in the sensitive powers of the soul—operates in animals like a kind of reason.<sup>167</sup> The other most commonly-cited case of the sub- or quasi-rational characteristics of animals was *aestimativa*. The problem

<sup>162</sup> *Ibid.*, 2189: “Primum, eas non apprehendere tempus, sed ea, quae sunt in tempore, ut frigus aut calorem, illud hyemis, hunc aestatis.”

<sup>163</sup> *Ibid.*, 2189: “Incorporeum enim quidpiam est tempus, quod sensum & phantasiam, quae corporea tantum & sensilia compreahendunt, effugiat.”

<sup>164</sup> *Ibid.*, 2189: “Ego tamen hoc loco non audio solum hominem affirmari temporis sensum habere . . .”

<sup>165</sup> *Ibid.*, 2189: “Is enim per se tempus sentit, caetera ex accidenti, utpote quae non ipsis temporis sensus proprie habeant, sed motionis & passionis eius, quam tempore aliquo acceperunt.”

<sup>166</sup> See e.g. Toletus, *Commentaria . . . de Anima*, 127r ff.

<sup>167</sup> *Ibid.*, 127r–128v.

facing all discussions of the mental powers of animals was that of reconciling their irrational nature with the frequently sophisticated character of much of their behaviour, as evidenced by experience or textual authority. The approach taken by many commentators when treating animal prudence or estimation was often to claim that this apparently 'rational' behaviour only shadows or imitates human behaviour. Late renaissance readings of the *De Anima* passage concerning the appetites and a 'sense of time' exemplify this approach, since many classical commentators, and also common experience, suggested that animals must possess some awareness of time. However, the strong connection that Aristotle established between time and the intellect contradicted this evidence. In response, the early modern commentators I have discussed attempted to reconcile these divergent strands by fitting together evidence of animals' awareness of time—and sometimes wider questions about the role of sense in the perception of time—with the canonical Aristotelian connection between time and the intellect. They also addressed the idea that a particular mental power, or 'sense', allows man to orient himself in time, and to make moral and pragmatic decisions based upon his awareness of time. Any plausible account of human nature in the late Aristotelian tradition had to take account of man's particular character as a rational animal, but, as this chapter has demonstrated, it also characterized his nature as temporal. The various 'new philosophies' that challenged and sought to supplant Aristotelianism and scholasticism from the sixteenth century onwards responded to this approach in different ways. The next two chapters explore how two well-known *novatores*, René Descartes and Thomas Hobbes, pursued this dialogue.



PART TWO

TIME AND THE SCIENCE OF THE SOUL IN  
THE NEW PHILOSOPHY



## CHAPTER THREE

### DESCARTES

#### *Introduction*

Of the three major topics discussed in Book IV of Aristotle's *Physics*, it might seem that the last, time, played a relatively confined role in Descartes' philosophy. Certainly, he did not write at great length about it and, unlike questions of space and extension, it was not placed unambiguously at the heart of his philosophy. Nevertheless, it is clear that Descartes saw time and duration as important to any discussion of corporeal nature, but also as things that, unlike extension, were shared by both body and soul. For Descartes, both *res extensa* and *res cogitans* endure and exist in time: on this fundamental level, time was an unusual concept in the Cartesian system because it involved the body and the soul together. Time was also in a sense critical to the persona of the Cartesian philosopher and his audience, since Descartes often took pains to emphasize that the project of philosophy is one that takes place over time, often a great length of time, and that the radical act of questioning one's metaphysical and epistemological foundations takes place at a decisive moment: *semel in vita*.

This chapter charts Descartes' engagement with some of the assumptions about time, duration and the soul explored in the two previous chapters. It shows that although he rejected many of these insights, crucial parts of his notion of what time is, and of how it might relate to the soul, can profitably be read in an Aristotelian context. In particular, I argue that Descartes engaged more closely with notions of how the soul and the human subject figure in the ontology of time outlined in Chapter One than with concerns expressed in the Aristotelian psychology of time, although some of his critics forced him to consider issues arising from it. He was not uninterested in the connections between time and the soul, but he seems to have approached them through ontology or metaphysics rather than through psychology. This is perhaps understandable in the light of his wholesale rejection of key elements of the late Aristotelian science of the soul. However, traces of the notion that connections between time and the soul contribute to the human subject's ability to orient itself

in time survived within Descartes' work, particularly in his treatment of the passions in his final work.

### *Descartes' Late Aristotelian Context*

Perhaps more than any other major philosopher of the seventeenth century, Descartes' engagement with his Aristotelian contemporaries and predecessors is widely documented, both in his published works and in his correspondence. Yet making sense of it is not a simple task. Like Hobbes and other proponents of the 'new philosophy', Descartes could be openly contemptuous of late scholastic philosophy. Paraphrasing Cicero, in the autobiographical section of his *Discourse on the Method* (1637), he noted sardonically that "in my college days I discovered that nothing can be imagined which is too strange or incredible to have been said by some philosopher."<sup>1</sup> The young Descartes had studied late Aristotelian philosophy, including the *Physics*, at La Flèche.<sup>2</sup> The *Discourse* also mentions Descartes' realization that "As for the other sciences, in so far as they borrow their principles from philosophy I decided that nothing solid could have been built upon such shaky foundations."<sup>3</sup> But this overt cynicism and scepticism about scholastic philosophy was a rhetorical stance that concealed a more sophisticated engagement with the 'shaky foundations' of late Aristotelian thought. This engagement took several forms. Initially, Descartes wanted to foster debate with the Jesuits and other scholastic philosophers, and to encourage their responses to the Cartesian system, a project that was connected to his desire to see Cartesianism taught in European universities and colleges.<sup>4</sup> The most famous consequence of Descartes' wish to debate with his contemporaries was of course the publication, facilitated by Marin Mersenne, of the five sets of *Objections* together with Descartes' *Meditations* in 1641. As well as encouraging Jesuits and other scholastics to read his work, however, Descartes had also

<sup>1</sup> René Descartes, *The Philosophical Writings of Descartes: Volume I*, transl. John Cottingham, Robert Stoothoff and Dugald Murdoch (Cambridge: Cambridge University Press, 1985), 118.

<sup>2</sup> Camille de Rochemonteix, *Un Collège de Jésuites aux XVII<sup>e</sup> et XVIII<sup>e</sup> Siècles: Le Collège Henri IV de La Flèche* (4 vols. Le Mans, Leguicheux Imprimeur-Librairie, 1889), vol. IV, 27–8, 32–6, 36–49, 51–3.

<sup>3</sup> Descartes, *Philosophical Writings Volume I*, 115.

<sup>4</sup> Roger Ariew, "Descartes and Scholasticism: the Intellectual Background to Descartes' Thought," in *The Cambridge Companion to Descartes*, ed. John Cottingham (Cambridge: Cambridge University Press, 1992), 58–90.

begun to re-read theirs in the 1640s. It seems that after leaving La Flèche in 1614 he had not kept up to date with the latest Aristotelian philosophy. Provoked by his increasingly rancorous dispute with the Jesuits, he wrote to Marin Mersenne on 30 September 1640 to tell him that

I feel like reading some of their [i.e. the Jesuits'] philosophy, which I have not looked at for in twenty years. I want to see if I like it better now than I did before. For this purpose, I beg you to send me the names of the authors who have written textbooks of philosophy, and to tell me which are the most commonly used, and whether they have any new ones since twenty years ago. I remember only some of the Conimbricenses, Toletus, and Rubius. I would also like to know if there is in current use any abstract of the whole of scholastic philosophy; this would save me the time it would take to read their huge tomes. There was, I think, a Carthusian, or Feuillant who made such an abstract, but I do not remember his name.<sup>5</sup>

The mystery Feuillant was Eustachius a Sancto Paulo, whose *Summa Philosophiae Quadripartita* acquired a kind of totemic status for Descartes that some modern readers have judged to be undeserved. He called the *Summa* "the best book of its kind ever made," and much preferred it to either D'Abra de Raconis' textbook, or the writings of the Coimbrans, which he found "too lengthy."<sup>6</sup> He wrote to Mersenne on 11 November 1640 that he planned to "write a series of theses which will constitute a complete textbook of my philosophy," and which would be combined with a commentary on Eustachius, "with notes by me at the end of each proposition. In the notes I will add the different opinions of others, and what one should think of them all, and perhaps at the end I will make a comparison between the two philosophies."<sup>7</sup> Descartes seems to have abandoned this project some time after hearing of Eustachius' death earlier in 1640, although he preserved the idea for a while as a strategy in his skirmishes with the Jesuits; by 1644, the 'series of theses' that would have formed the first part of the Eustachius project had been transformed into the *Principia Philosophiae*. Descartes later stated that he had "completely lost the intent to refute this philosophy"; in typical Cartesian style, he claimed that "I see that it is so absolutely and clearly destroyed by means of the establishment of my philosophy alone, that no other refutation

<sup>5</sup> René Descartes, *The Philosophical Writings of Descartes: Volume III: The Correspondence*, transl. John Cottingham, Robert Stoothoff, Dugald Murdoch and Anthony Kenny (Cambridge: Cambridge University Press, 1991), 153–4.

<sup>6</sup> René Descartes, *Oeuvres*, ed. C. Adam and P. Tannery (11. vols. Paris: Vrin, 1894–1913), vol. III, 232, 251.

<sup>7</sup> Descartes, *Philosophical Writings Volume III*, 156–7.

is needed.”<sup>8</sup> This claim fits with his earlier characterization of late Aristotelianism: “I do not think that the diversity of the opinions of the scholastics makes their philosophy difficult to refute. It is easy to overturn the foundations on which they all agree, and once that has been done, all their disagreements over detail will seem foolish.”<sup>9</sup>

Scholars have been aware of these details of Descartes’ engagement with scholasticism for many years.<sup>10</sup> However, their relationship to the substance of his philosophy is harder to understand.<sup>11</sup> It is clear that Descartes read some of the late Aristotelian texts discussed in the first two chapters, but the use to which he put them is less transparent. Roger Ariew has taken a relatively conservative view of the influence of these texts on Descartes, arguing that he had probably forgotten the philosophy he was taught at La Flèche when writing the great works of 1637–40, and that even the traces of Aristotelian concepts and categories in his mature works are “likely to be deceptive for the interpreter.”<sup>12</sup> This opinion is shared by other modern commentators, who often see the connections between Cartesianism and scholasticism as largely illusory. In the case of the discourse of time and the soul identified in my first two chapters, I believe that a more positive interpretation is possible. Whilst I do not wish to exaggerate the connections between Descartes’ treatment of these issues and his late Aristotelian context, I think that many of these connections are nevertheless valid and important to understanding the place of time in this discourse.

### *The Cartesian Ontology of Time*

In Chapter One, I outlined the development of arguments about the ontology of time within the late Aristotelian tradition, and described the increased prominence of a discourse of ‘internal’ and ‘external’ time

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<sup>8</sup> Descartes, *Oeuvres*, vol. III, 470.

<sup>9</sup> Descartes, *Philosophical Writings Volume III*, 156.

<sup>10</sup> Recent examples of engagement with this issue include Roger Ariew, “Les Principia et la Summa philosophia quadripartita,” in *Descartes: Principia Philosophiae (1644–1994): atti del Convegno per il 350° Anniversario della Pubblicazione dell’Opera*, ed. Jean R. Armogathe and Giulia Belgioioso (Naples: Vivarium, 1996), 473–489 and Laurence Brockliss, “Rapports de structure et de contenu entre les *Principia* et les cours de philosophie des Collèges,” in *Descartes: Principia philosophiae (1644–1994)*, 491–516.

<sup>11</sup> See Michael Edwards, “Aristotelianism, Descartes, and Hobbes,” *Historical Journal* 50:2 (2007): 458–460.

<sup>12</sup> Ariew, “Descartes and Scholasticism,” 76–7.

in early seventeenth-century textbooks. As we have seen, discussions of internal and external time in this period distinguished between time's internal aspect, which was nothing other than the particular duration of an individual body or subject, and its external aspect, which was a 'common' or universal time constituted from the number of heavenly motion. Whilst internal time was a real being, and depended on the continuing existence of individual real beings, external time was typically seen as a rational, mental creation. In this section I argue that many of Descartes' statements about the nature of time in the *Meditations* and *Replies*, particularly in his debates with Pierre Gassendi, and in the *Principia Philosophiae* engaged with this late Aristotelian language of internal and external time. The *Principles* in particular was written around the time when Descartes was reading Eustachius, one of the most well-known theorists of internal and external time; as I have mentioned, it has been suggested that this work emerged from the remains of Descartes' abandoned 'Eustachius project'. Although compared to those of his late Aristotelian contemporaries, Descartes' discussions of the nature of time were not extensive, his commitment to the notion that time, duration and being are intimately connected, and his engagement with concepts found in their textbooks suggest that he upheld an 'ontology of time' in a comparable way to them.

### *Time in the Meditations*

Descartes' treatment of duration and time in the *Meditations* began in the First Meditation, where he argued that the time through which extended things (that is, corporeal nature) may endure (or, as the later French version puts it, "The time which measures their duration") appears to be numbered amongst those "simpler and more universal" things that are real.<sup>13</sup> Like quantity and place, time was simple and universal in nature, but also somehow foundational, like "the real colours from which we form the images of things."<sup>14</sup> The Meditator goes on to contrast the nature of time and the other simple and universal things with paintings, dreams and other such imaginary, fictitious creations, a point that implies a rejection of the Aristotelian theory of imaginary or imagined time: a position that

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<sup>13</sup> René Descartes, *The Philosophical Writings of Descartes: Volume II*, transl. John Cottingham, Robert Stoothoff and Dugald Murdoch (Cambridge: Cambridge University Press, 1984), 14.

<sup>14</sup> *Ibid.*, 14.

was held by all of the textbook authors who supported internal and external time. Although in *Le Monde* Descartes used the notion of 'imaginary spaces' as a hypothetical location for his natural philosophy, and in his correspondence with Pierre Chanut he also mentioned the 'imaginary time' that existed before the creation of the world, for him time could never be imaginary in the sense of being wholly fictitious or imagined.<sup>15</sup> This was perhaps because of the strong links he established between duration, time and existence elsewhere in his philosophy.

If the First Meditation asserted time's real nature and universality, the Third Meditation addressed the particular contribution that the soul or mind might be said to make to the concept of time. In Meditation Three, the Meditator suggests that the concept of time itself may be derived from our existence and from the operations of the soul. Meditation Two had previously argued that the soul is better-known than the body, and so looking at the soul to discover a clear and apparent notion of time was clearly a valid possibility; it is certainly a notion that reappeared later in Descartes' argument. However, in this case Descartes made the body and the soul taken together the source for our idea of duration. In his discussion of "my ideas of corporeal things", the Meditator argues that "I can see nothing in them which is so great (or excellent) as to make it seem impossible that it originated in myself."<sup>16</sup> As for the "clear and distinct elements in my ideas of corporeal things," he continues, "it appears that I could have borrowed some of these from my idea of myself, namely substance, duration, number and anything else of this kind."<sup>17</sup> In the case of duration, a combination of self-consciousness and self-reflection about one's own existence in time could be said to produce a clear and distinct idea of what it is to endure: "Again, I perceive that I now exist, and remember that I have existed for some time; moreover, I have various thoughts that I can count; it is in these ways that I acquire the ideas of duration and number which I can then transfer to other things."<sup>18</sup> Our notion of duration may be derived from our own existence, and we achieve this awareness of the duration of body and soul together through the operation of the mental faculties of perception and memory. This passage connected duration and existence in a fundamental way, since our idea of the duration

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<sup>15</sup> *Ibid.*, 320.

<sup>16</sup> *Ibid.*, 29.

<sup>17</sup> *Ibid.*, 30.

<sup>18</sup> *Ibid.*, 30–31.

of external objects can come only from an awareness of the internal duration of our own existence.

The Meditator's suggestion that our idea of duration may derive from ourselves connected two strands of argument that Descartes' late Aristotelian contemporaries largely separated: the notion that reflexivity or self-reflection can be connected to time or duration, and the broader argument that duration and existence need to be understood together. Although, as we have seen, authors such as Keckermann argued that our awareness of the form of duration they called internal time is produced by reflection upon our own life and existence, Descartes' argument here was substantially different. Rather than being an activity of the intellective soul that endures and occurs in and through time, reflexive thought becomes an activity connected to perception and memory from which our idea of time derives.

The argument that our clear and distinct notion of duration may derive from ourselves also bears some resemblance to the 'Galenic' and Augustinian theories of time discussed and rejected by many late renaissance Aristotelian authors, not least in the connection it made between mental activity, the subject or self, and duration. Augustine's theory of time seems particularly relevant here, given the well-established (if controversial) connections drawn by scholars between human subjectivity and Augustinianism in Descartes.<sup>19</sup> Augustine's argument in Chapter 11 of the *Confessions* that time is measured in the mind and constitutes a flow of experience through the mind in which hope, memory and perception correspond to future, past and present resembles Descartes' comments in the *Meditations* in several respects, not least in its assumptions about self-reflection undertaken by a subject or self in time, but I want to suggest that late Aristotelian assumptions about duration and time may offer an equally profitable, if somewhat less familiar, context against which to read Descartes.

The connection between duration, time and existence posited here was developed in the best-known discussion of time in the *Meditations*, where the Meditator considers the question of continual (or continuous) creation. In the context of his broader argument about God as the author

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<sup>19</sup> The literature on Descartes and Augustine is extensive: see *inter alia* Stephen Menn, *Descartes and Augustine* (Cambridge: Cambridge University Press, 1998); Charles Taylor, *The Sources of the Self: The Making of Modern Identity* (Cambridge, MA: Harvard University Press, 1989), 127–158; also Michael Hanby, *Augustine and Modernity* (London: Routledge, 2003), 134–165.

of our existence, he first rejects the possibility that we might derive our existence either from ourselves, or from our parents, arguing that,

I do not escape the force of these arguments by supposing that I have always existed as I do now, as if it followed from this that there was no need to look for any author of my existence. For a lifespan can be divided into countless parts, each completely independent of the others, so that it does not follow from the fact that I existed a little while ago that I must exist now, unless there is some cause which as it were creates me afresh at this moment—that is, which preserves me. For it is quite clear to anyone who attentively considers the nature of time that the same power and action are needed to preserve anything at each individual moment of its duration as would be required to create that thing anew if it were not yet in existence. Hence the distinction between preservation and creation is only a conceptual one, and this is one of the things that are evident by the natural light.<sup>20</sup>

It might seem that the ‘nature of time’ is not the central concern of this passage. However, it has become the basis for a sustained scholarly debate about whether Descartes believed time to be continuous, or discontinuous. Descartes’ assertion that the past, present and future parts of time are independent of each other has been taken by many scholars as an argument that time is composed of indivisible temporal atoms, and that any continuity between these temporal atoms that we perceive in time is supplied by our mind.<sup>21</sup> Perhaps the most influential exponent of this view is Martial Gueroult, who, in an argument influenced by Henri Bergson’s reading of Descartes, argues that Descartes held a ‘cinematographic’ notion of time, in which indivisible, discrete instants of time are translated into temporal continuity by the soul.<sup>22</sup> Gueroult’s argument makes the action of the soul play an important role in our understanding of time,

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<sup>20</sup> Descartes, *Philosophical Writings Volume II*, 33.

<sup>21</sup> Jean Vigier, “Les Idées de Temps, de Durée et d’Eternité dans Descartes,” *Revue Philosophique de la France et de l’Etranger* 89 (1920): 196–233; Jean Wahl, *Du Rôle de l’Instant Dans la Philosophie de Descartes* (Paris: Alcan, 1920); M. Kamiya, *La Théorie Cartésienne du Temps* (Tokyo: Librairie-Editions France Toshio, 1982); Martial Gueroult, *Descartes’ Philosophy Interpreted According to the Order of Reasons*, transl. Roger Ariew (2 vols. Minneapolis: University of Minnesota Press, 1984), vol. I, 196–202; Ken Levy, “Is Descartes a Temporal Atomist?” *British Journal for the History of Philosophy* 13: 4 (2005): 627–674; Clarence Bonnen and Daniel Flage, “Descartes: The Matter of Time,” *International Studies in Philosophy* 32 (2000), 1–11.

<sup>22</sup> Gueroult, *Descartes’ Philosophy*, vol. I, 197: “Thus our mind, in conformity with the law that imposes regularity, as if from the outside, on the intrinsically independent acts of creation, translates the continuous repetition of the free and discontinuous creation of independent and self-sufficient states, into the continuity of one and the same movement, which is proposed to our eyes as accomplishing a path, developing and engendering itself in time.”

but he ultimately believes that time is constituted from a series of discrete instants. Continuous time, he argues, is time seen from “the abstract point of view”, rather than a reflection of its real nature, although it is not simply a product of our mind, since it is based on God’s laws.<sup>23</sup>

Gueroult’s notion of the fundamental discontinuity of time has been opposed by a number of scholars.<sup>24</sup> The most sustained account of the continuity of time in Descartes’ philosophy is offered by Jean-Marie Beyssade, who argues that, because the soul is better known to us than the body, our understanding of time should begin with it; and since Descartes believed that thought is a continuous temporal process, time itself must be continuous.<sup>25</sup> Unlike Gueroult, Beyssade uses the involvement of the soul in time to structure his account of its nature, and as a basis for his re-interpretation of Descartes’ philosophy from the perspective of time. Although Gueroult, Beyssade and the others hold opposing positions, they still agree about the essential nature of the problem. They believe that the statements about time found in the Third Meditation should be read as arguments for or against the continuity of time. More recently, however, both Jorge Secada and Daniel Garber have suggested that Descartes did not in fact regard temporal atomism and the continuity of time as important issues; rather, they suggest, he had no demonstrable interest in these questions at all.<sup>26</sup> What Descartes actually *did* have in mind in this passage, though, is less clear.<sup>27</sup> I want to approach this question by suggesting that some of the late Aristotelian arguments that I identified in Chapter One may provide a useful context both for reading Descartes’ statements about time in the *Meditations* and for connecting them to his discussion of duration and time in the *Principia Philosophiae*. This approach is more in keeping with the work of Jean-Luc Solère, who has noted potential parallels

<sup>23</sup> *Ibid.*, vol. I, 197.

<sup>24</sup> Jean Laporte, *Le Rationalisme de Descartes* (Paris: Presses Universitaires de France, 1950); Jean-Marie Beyssade, *La Philosophie Première de Descartes: Le Temps et la Cohérence de la Métaphysique* (Paris: Flammarion, 1979); Richard T.W. Arthur, “Continuous Creation, Continuous Time: A Refutation of the Alleged Discontinuity of Cartesian Time,” *Journal of the History of Philosophy* 26 (1988): 349–75.

<sup>25</sup> Beyssade, *La Philosophie Première de Descartes*.

<sup>26</sup> Daniel Garber, *Descartes’ Metaphysical Physics* (Chicago: University of Chicago Press, 1992), 266–273; Jorge Secada, “Descartes on Time and Causality,” *The Philosophical Review* 94:1 (1990): 45–72.

<sup>27</sup> Secada argues that he is interested in the connection between time and causation; Secada, “Descartes on Time and Causality.”

between medieval arguments about duration and Descartes' philosophy, and particularly the importance of Suárez's metaphysics.<sup>28</sup>

*The Fifth Objections and the Debate with Gassendi*

Another way of looking at the passage in Meditation Three, which raises questions about the connections between Descartes' theory of time and the late Aristotelian context discussed earlier, is thus possible. It is not an approach that has been pursued by many modern scholars, but it has the benefit of originating in the response of an intelligent contemporary critic who, although he opposed most of Descartes' arguments, also understood many of his assumptions. This reading appeared in Pierre Gassendi's response to the *Meditations*, the *Fifth Objections*, and was developed in the ensuing debate between Descartes and Gassendi, which was eventually re-edited and published by Gassendi as his *Disquisitio Metaphysica* (1644).<sup>29</sup> Gassendi's comments were unusual amongst the *Objections* because, unlike many of Descartes' other opponents, he really attempted to engage critically with the metaphysical basis of the Cartesian system, without sharing many of its assumptions.<sup>30</sup> However, he did so as someone with a firm grasp of scholastic philosophy; his treatment of Descartes' concept of time was therefore both critical and well-placed to pick up on its engagement, apparent and real, with late Aristotelian themes. Modern scholars, though, have generally been more interested in locating this critique within the development of Gassendi's philosophy of time than in treating it as a viable reading of Descartes, an approach sometimes linked to their judgement that Gassendi often missed the point of his opponent's positions. This perspective perhaps owes something to Descartes' hostility to Gassendi's objections; he told Mersenne in a letter of 23 June 1641 that

You will see that I have done everything I could to deal with M. Gassendi in an honourable and considerate way. But he has given me so many grounds to despise him, and to point out his lack of common sense and inability

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<sup>28</sup> Jean-Luc Solère, "Descartes et les Discussions Médiévales sur le Temps," in *Descartes et le Moyen Age*, ed. Joël Biard and Roshi Rashed (Paris: Vrin, 1997), 329–348.

<sup>29</sup> Olivier Bloch, *La Philosophie de Gassendi: Nominalisme, Matérialisme et Métaphysique* (La Haye: Martinus Nijhoff, 1971); *Idem*, "Gassendi Critique de Descartes," *Revue Philosophique de la France et de l'Etranger* 156 (1966): 217–236; Thomas M. Lennon, "Pandora: Or, Essence and Reference: Gassendi's Nominalist Objection and Descartes' Realist Reply," in *Descartes and his Contemporaries: Meditations, Objections, and Replies*, ed. Roger Ariew and Marjorie Grene (Chicago: University of Chicago Press, 1995), 159–181.

<sup>30</sup> Lennon, "Pandora," 161; Bloch, "Gassendi Critique de Descartes."

to argue in any rational manner, that I should have been lackadaisical in defending my own just cause if I had said any less than I did—and I assure you that I could have said a lot more.<sup>31</sup>

This hostility, which Gassendi repaid in good measure, should not blind us to the possibility that Gassendi sometimes did hit the mark. In particular, the sections dealing with the Meditation Three passage on continuous creation and the nature of time are an interesting and somewhat neglected aspect of his critique that reveal much about Descartes' theory of time and duration and its connections to contemporary Aristotelian theories of internal and external time.

Gassendi's response to the passage on continual creation and time began with an attack on the notion of continual creation or conservation itself. He argued that, whilst there clearly are some effects that require continual conservation or re-creation to continue in existence, there are also many things that will continue to exist even if their cause no longer does:

For there are indeed certain effects that, in order to endure and not to cease at whatever instant, require the presence and continuation of the action of the cause by which they first began, of which kind are the light of the Sun... but there are many other similar effects that continue to exist not only when the cause that made them appear no longer acts, but also, if you will, when it is corrupted and reduced to nothing.<sup>32</sup>

He then moved to consider Descartes' statement of the alleged independence and separability of the parts of time, replying that, in reality, there is nothing that has parts which are less separable and dissoluble:

But the parts of your time do not depend on each other. Here it can be replied: what conceivable thing is there whose parts are more mutually inseparable? Between whose parts is there a more inviolable sequence and

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<sup>31</sup> Descartes, *Philosophical Writings Volume III*, 184.

<sup>32</sup> Pierre Gassendi, *Disquisitio metaphysica, seu dubitationes et instantiae adversus Renati Cartesii metaphysicam et responsa*, ed. Bernard Rochot (Paris: Vrin, 1962), 333: "Nam sunt nonnulli quidem effectus, qui ut perseverent, neque momento quolibet deficiant, indigent praesentia, continuaque efficientia causae, per quam primum esse cooperunt, cuiusmodi est Solis lux (quoniam hujusmodi effectus non tam idem reipsa sunt, quam aequivalenter, ut de fluminis aqua dicitur): at videmus alios, qui perseverent non modo ea causa, quam agnoscant, non amplius agente, sed, si velis, etiam corrupta, redactaque in nihilum."

connection? And whose latter parts can be less disconnected, and cohere more, and depend more on its former parts?<sup>33</sup>

The notion that time is an inseparable and inherently connected whole reappeared in Gassendi's later writings; indeed, it formed the basis of his own theory of time, which, as it will become apparent, emerged from a sustained dialogue with Descartes and late Aristotelian theories of time. Having asserted the inseparability of the parts of time, Gassendi went on to question the role played by the independence of the parts of time in the Meditator's argument. In effect, he challenged the connection assumed in Meditation Three between divisible or discontinuous time and discontinuous existence requiring continual recreation:

But not to press this point, what therefore does either the dependence or the independence of the parts of time, parts that are external, successive and inactive, have to do with your production or reproduction? Really nothing more than the flow and passage of the parts of water [has to do with] the production or reproduction of some rock that a river flows past.<sup>34</sup>

For Gassendi, time was essentially something external, inert, successive and located outside of things in time, and not therefore obviously connected to the continued existence of a subject in time, or indeed with that subject's mental life. He agreed with Descartes' suggestion that a man cannot deduce his own continuation in existence from the fact that he has previously existed, but argued that this is not because he needs a cause to continually re-create himself, but because an internal or external cause could harm, corrupt or destroy him at any moment.<sup>35</sup>

Descartes' initial response to Gassendi's criticism of this section of Meditation Three was relatively brief, and, in keeping with the rest of his debates with Gassendi, quite intemperate. He began by introducing the

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<sup>33</sup> *Ibid.*, 333: 'At partes tui temporis non dependent aliae ab aliis. Hic instari posset, quae-nam sit excogitabilis res, cuius partes sint a se invicem inseparabiles magis? inter cuius parteis sit inviolabilior series, et connexio? cuius quae sunt partes posteriores possint minus averti, magis cohaerere, magis dependere a prioribus?'

<sup>34</sup> *Ibid.*, 333: 'Sed ne haec urgeamus, quid propterea facit haec seu dependentia, seu independentia partium temporis, quae externae sunt, successivae sunt, activae non sunt, ad tui productionem, reproductionemve? Profecto nihil magis, quam fluxus, ac pertransitio partium aquae, ad productionem, reproductionemve alicujus rupis, quam fluvius praeterfluit.'

<sup>35</sup> *Ibid.*, 333–4: 'Verum est in te aliqua vis, qua possis existimare te quoque paulo post futuram: non tamen necessario, aut indubie; quia illa tua vis, seu naturalis constitutio, quaecumque ea sit, eo non extenditur, ut omnem causam corruptentem, seu internam, seu externam arceat. Quare et futura es, quod vim habeas, non quae de te novo producat, sed quae, ut perseveres, praestare sufficiat, nisi corrumpens causa superveniat.'

familiar scholastic distinction between a cause *secundum esse* and *secundum fieri* (roughly, cause according to being and according to becoming). Causation *secundum fieri* is in a sense absolute, since once the action is achieved or produced it can continue in the absence of its cause; Descartes cited the examples of an architect creating a house, and a father producing a son here.<sup>36</sup> Causation *secundum esse*, on the other hand, requires the continued presence of the cause for its effects to continue; thus the production of light by the Sun, and God's causation of created beings are acts of causation not merely *secundum fieri*, but also *secundum esse*.<sup>37</sup> This point, Descartes insisted, is clearly demonstrated by his argument about the independence of the parts of time, although Gassendi has tried

...in vain to evade my argument by talking of the necessary 'connection' which exists between the divisions of time considered in the abstract. But this is not the issue: we are considering the time or duration of the thing that endures (*de tempore seu duratione rei durantis*), and here you would not deny that the individual moments can be separated from those immediately preceding and succeeding them, which implies that the thing which endures may cease to be at any moment.<sup>38</sup>

In defending his thesis about the essential divisibility of the parts of time, Descartes therefore distinguished between two different forms of time. He argued that Gassendi's characterization of time as constituted from unconnected parts represented abstract time, or time considered abstractly. His own argument about the parts of time and continuous creation, on the other hand, depended on an understanding of time as the "duration of an enduring thing": that is, on a notion of time derived from the existence of that thing. He contrasted this concept of the time of an "enduring thing that may at one single moment cease to be" or, to extend the terminology that Descartes himself used, 'concrete' time, with what he saw as Gassendi's 'abstract' time. Thus when he argued that the parts of time are divisible, Descartes believed that he was describing the characteristics of a time that was closely related to individual beings. Although his chief

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<sup>36</sup> *Ibid.*, 337: "Cum negas nos continuo causae primae influxus indigere, ut conservemur, negas rem quam Metaphysici omnes ut manifestam affirmant, sed de qua saepe illiterati non cogitant, quia tantum ad causas *secundum fieri*, non autem *secundum esse* attendunt. Sic Architectus est causa domus, et pater filii *secundum fieri* tantum, ideoque cum opus absolutum est, potest potest absque istiusmodi causa remanere..."

<sup>37</sup> *Ibid.*, 337: "...sed Sol est causa lucis ab ipso procedentis, et Deus est causa rerum creatarum non modo *secundum fieri*, sed etiam *secundum esse*; ideoque debet semper eodem modo influere in effectum, ut eundem conservet."

<sup>38</sup> Descartes, *Philosophical Writings Volume II*, 255.

target in this passage was Gassendi's claim about the divisions of time, it is also significant that in some respects, Descartes' language here echoed the accounts of internal or intrinsic time given by late Aristotelian textbook authors such as Timpler and Eustachius. These authors, although they did not always stress the divisible nature of time, founded their accounts of internal time on the connection between duration and the 'enduring thing.' It is important to acknowledge that Descartes was not reflecting their concerns exactly, but a significant parallel nevertheless emerges. Gassendi picked up on this apparent parallel in his reply.

Gassendi's 'Instantia', or reply to Descartes' responses, took the form of a long discussion entitled "A paralogism remains, from the assumption that the condition or nature of time is other than it is."<sup>39</sup> As its title indicates, Gassendi used this opportunity not only to criticize the assumptions made by Descartes about time, but also to establish his own concept of time, which he formulated in contrast to Descartes and what he perceived as his opponent's debt to the Aristotelian tradition. Gassendi began by returning to the original passage from the Third Meditation, suggesting that the clarity of definition that Descartes believed it to contain was illusory: "For firstly you suppose that the nature of time, than which nothing is more obscure, is clear."<sup>40</sup> This Augustinian statement of time's obscure and elusive nature was a sentiment found originally in the *Confessions* and, as I noted earlier, something of a commonplace amongst early modern Aristotelian authors. Evidence of the obscurity of time is provided, Gassendi suggested, by the variety of opinions about it expressed by classical and contemporary philosophers.<sup>41</sup> Picking up on the brevity and splenetic nature of Descartes' response to his criticisms in the *Fifth Objections*, Gassendi went on to claim that, although the mind of the Meditator is allegedly ignorant of the outside world, it is somehow clear about the nature of time; but when Gassendi himself formulated his objection to this clarity, Descartes could only reply with an assertion of his authority, which cannot amount to a firm demonstration of the nature of time.<sup>42</sup>

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<sup>39</sup> Gassendi, *Disquisitio metaphysica*, 343–4: "Remanere Paralogismum ex assumpta Temporis conditione, seu natura alia, quam sit."

<sup>40</sup> *Ibid.*, 343: "Nam primo perspicuam supponis temporis naturam, qua nihil potest dici obscurius."

<sup>41</sup> *Ibid.*, 343: "Indicio sane esse potest vel innumerabilis illa opinionum varietas, quae apud antiquos Philosophos fuit, quaeque etiamnum perseverat."

<sup>42</sup> *Ibid.*, 343–5: "Tametsi enim tu me dicas Mentem alloqui, quae re sciat quidem an Philosophi fuerint, quaeque illorum authoritate moveatur; cum haec nihilominus Mens ignara adeo rerum omnium, quae extra se sunt, supponat temporis naturam esse adeo

This kind of barb was typical of their exchanges, and reflected Gassendi's apparent delight in baiting Descartes.

Gassendi then criticized Descartes for failing to explain the nature of time clearly, and implied that his treatment of the question should really have addressed some key questions: "... how you would oblige the whole nation of the learned if you could show the nature of time in a clear way, if you could explain whether it is something real or not, how it differs or does not differ from the enduring thing; what is in it, or not in it, and all these other similar points!"<sup>43</sup> These demands drew explicitly on questions about the nature of time familiar from the late Aristotelian tradition. Most of the problems Gassendi referred to were very close in form to the *quaestiones* found in almost every contemporary *Physics* commentary or textbook of natural philosophy. Two of them in particular (whether time is real or not, and its relationship to 'the enduring thing') have a special relevance here. The first problem made a clear reference to contemporary debates about time's ontological status as *ens reale* or *ens rationis*. The relevance of this distinction to Descartes' notion of duration is clear. It is certainly possible to interpret the discussion of a possible psychological basis of time and duration in Meditation Three in the light of the distinction between time as *ens reale* and *ens rationis* found in the Aristotelian tradition. Although Descartes did not use these terms, his treatment of the origins of our idea of duration might imply that at this point he engaged with the question of whether duration is primarily a (rational) product of the mind or soul, which we transpose onto external objects. The passage in the Third Meditation explicitly considers that we might derive this idea from our own existence. The Meditator's sceptical challenge about the origins of the concept of duration was thus not only a question of the security of our beliefs and ideas, but can also be seen as an attempt to determine whether time is in some sense real or rational.

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perspicuum, ut demonstrationem exinde contextat; et me de perspicuitate illa dubitante (ob caliginem, quae sola est causa varietatis opinionum inter tot alioquin sapientes, perspicacesque Philosophos) ipsa Mens non alia ratione perspicuitatis fidem faciat, quam authoritatem suam obstrutendo; non subest profecto, cur ego aut alius, autoritate ejus moveamur, ipsamque ejus authoritatem fundamentum esse, aut principium, demonstrationis existemus."

<sup>43</sup> *Ibid.*, 345: "Et quam beabis deinceps nos! quam obstringes totam Sapientum nationem, si perspicuum, et in aperto feceris Temporis naturam, si explicueris utrum sit aliquid reale, an-non? qui a re durante differat, aut non differat; quid in illa sit, vel non sit; caeteraque his consimilia!"

Gassendi's second question also seemed to refer to discussions by Suárez and others of the nature of the distinction between existence and duration.<sup>44</sup> Suárez's position on the second question, which Descartes seems to have echoed, was of course that there is no real distinction between duration and the enduring thing.<sup>45</sup> Gassendi then moved towards a tentative exposition of his own opinion of the nature of time, formulated in opposition to that of Descartes, and again beginning with Augustine's famous statement of the difficulty of understanding time.<sup>46</sup> For Gassendi, it was not enough simply to say that time or duration is a kind of continuous flux, without a beginning or end, and which cannot be delayed, impeded or accelerated.<sup>47</sup> If this kind of temporal flux "is taken according to all of its amplitude, and insofar as it lacks a beginning and an end, it can be called eternity, or the duration of God, which from the immutability of its nature coexists with all of that [time] as a rock co-exists with the river flowing around it."<sup>48</sup> However, if time is "taken according to its parts, it is the duration of things subject to generation and corruption, of which kind the whole world is, and of which kind are all the parts of the world or created things, which whilst they endure together are thought to endure not for many times, but through one and the same time."<sup>49</sup> When this time is successive,

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<sup>44</sup> Suárez, *Disputationes metaphysicae*, 453: "Utrum duratio in re distinguitur ab esse rei durantis"; Timpler, *Metaphysicae systema*, 54: "An duratio differat ab existentia & quomodo?"

<sup>45</sup> Suárez, *Disputationes metaphysicae*, 453: "Dicendum vero est durationem: & existentiam non distingui ex natura rei, sed tantum ratione. Hanc opinionem tenent Ocham in secundo quaestio. 10 & Gabriel in 2. distincto 2. quaest. 1. art. 1 & eandem significat Scotus ibidem quaestio 1 & Capreolus quaestio. 2 artic. 1 conclusio 5 & 6 & artic 3 praesertim in solutionibus argumentorum contra 2 part 6 conclusio ubi etiam Soncinas post conclusio 7 qui authores potissime loquuntur de duratione permanente, nam de tempore, & motu aliter sentire videntur, quod postea videbimus, nunc enim sine restrictione, & absolute intelligendo conclusionem positam."

<sup>46</sup> Gassendi, *Disquisitio metaphysica*, 345: "Quod ad me spectat, fateor ingenuo ignorare me Temporis naturam; ac tametsi mihi videar intelligere utcumque quid sit, explicare tamen, si velim non possum; mihiique statim praeclera illa D. Augustini verba succurrunt, *Quid est ergo tempus? Si nemo ex me quaerat scio; si quaerenti explicare velim nescio; quanquam etiam convinco me ideo nescire quid sit tempus, quod dicere aliis non possim quid sit.*"

<sup>47</sup> *Ibid.*, 345: "Certe pro voto satis non est, cum dico me concipere tempus, sive durationem, quasi quandam fluxum, qui nunquam cooperit, qui jam perseveret, qui nunquam desiturus sit: qui neque impediri, neque retardari, neque accelerari possit."

<sup>48</sup> *Ibid.*, 345: "Qui secundum totam suam amplitudinem acceptus, et quatenus principio, ac fine caret, dici possit aeternitas, seu duratio DEI, ipsi toti ob suae naturae immutabilitatem coëxistentis, ut coexistit rupes praeterlabenti flumini."

<sup>49</sup> *Ibid.*, 345: "...acceptus vero secundum parteis, sit duratio rerum exortui, interitique obnoxiarum, cuiusmodi est totus Mundus, cuiusmodi sunt omnes partes Mundi, sive res creatae, quae donec simul perseverant, non pluribus temporibus, sed uno, eodemque tempore durare censeantur."

man applies the measure of motion to it, which is also successive, and in particular the measure of heavenly motion. However, the application of motion—which can vary in speed—in this way does not make time itself flow faster or slower, “since it is of one course, whether something or nothing were to move: and on the contrary even if the World were to be created or destroyed, and whether something or nothing at all were to exist, it would continue invariably.”<sup>50</sup> Gassendi claimed to be less than satisfied with this initial sketch of his theory of time, but he nevertheless opposed it to the concept of time adopted by Descartes. It is this model of time as continually flowing, and fundamentally independent of both motion and existence or the soul that underpinned his criticism of Descartes’ notion of the divisibility and separability of the parts of time.<sup>51</sup>

Descartes’ attempt to defend his theory of time by introducing the distinction between time considered abstractly, and the “time of an enduring thing” attracted Gassendi’s attention at this point, prompting him to ask, “But what do you call abstract time, or time considered abstractly?”<sup>52</sup> Gassendi rejected the assumption that there can be more than one kind of time: “Indeed I know of only one [time], that I will not deny can indeed be called or considered abstract insofar as it does not depend on things, since whether things exist, or do not exist, whether they move or are at rest, [time] always flows at the same pace, and endures invariably.”<sup>53</sup> But although he conceded that his own definition of time might be considered ‘abstract’, Gassendi denied the existence of its counterpart in Descartes’ model, ‘concrete time’: “But I can truly in no way recognize that there is another [time] in addition to this one that could be called concrete or considered almost concretely, insofar as it coincides with things, or insofar as things endure by it.”<sup>54</sup> What Gassendi rejected in particular was the notion that time or duration can be considered in terms of individual

<sup>50</sup> *Ibid.*, 345: “Cujus denique, cum sit successivus, homines mensuram adinvenerint, motum scilicet successivum ipsum, ac caelestum potissimum; absque eo tamen, quod motu velociore, aut tardiore facto, fluxus temporis ideo fiat concitatior, aut segnior; quippe qui uno tenore sit, quique seu quidpiam moveatur, seu nihil; imo et si Mundus fiat, seu destruatur, et seu aliquid sit, seu nihil prorsus, invariabiliter continuet.”

<sup>51</sup> *Ibid.*, 345.

<sup>52</sup> *Ibid.*, 347: “At quid vocas tempus abstractum, abstracte consideratum?”

<sup>53</sup> *Ibid.*, 347: “Ego quidem unicum agnosco, quod non? diffitebor sane dici, aut considerari posse abstractum, quatenus non pendet a rebus, cum sive res sint, sive non sint; sive moveantur, sive quiescant, eodem semper tenore fluat, ac invariabiliter perseveret.”

<sup>54</sup> *Ibid.*, 347: “At esse aliud praeter istud, quod possit dici, aut considerari quasi in concreto, quatenus rebus competit, seu quatenus res illo durant, nullo profecto modo agnosco.”

bodies—that is, the view that we can talk of duration as an attribute of a thing. The assumption he rejected was of course central to Descartes' view and also to late Aristotelian accounts of internal and external time.

Descartes' concept of "the time of an enduring thing" made little sense to Gassendi, who was convinced that the only viable theory of time and duration must situate them outside objects in the world: "But I only ask, what else is the time of an enduring thing except that?"<sup>55</sup> At this point, Gassendi formally introduced the distinction between internal and external time, which he believed resembled Descartes' abstract-concrete distinction, into the argument: "You have heard that external and internal time are commonly distinguished: but if that of which I have spoken [i.e. abstract time] is external, what will internal time be?"<sup>56</sup> Gassendi's phrasing here was slightly ambiguous. The notion that Descartes had heard of the distinction between internal and external time might also imply that other commentators had noticed his use of these concepts, or simply that the abstract-concrete dichotomy was so closely associated with internal and external time in common usage that the connection is obvious. Certainly, it is clear that Gassendi read Descartes' treatment of time in the *Meditations* in these terms. Gassendi then developed a sustained critique of what he saw as Descartes' concept of internal time. His critique rested on his inability to understand how particular, individual internal times can be related to external time in a coherent manner:

I am for example a thing that has by now endured for fifty years, and I know that I have endured for the same duration as all my contemporaries, and all together we have not hitherto endured longer than any one of us; for since our birth so many myriads of years have not flowed as would be calculated if all those fifty-year spans were added together as many times as there are fifty-year old men. But I do not know this internal time that is particular to me, and which, beyond the external time that you call abstract, belongs to me in a concrete manner, and I do not understand more about it from you.<sup>57</sup>

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<sup>55</sup> *Ibid.*, 347: "Ego vero solum requiro, quoddam aliud tempus rei durantis sit, quam illud."

<sup>56</sup> *Ibid.*, 347: "Audivisti vulgo distingui tempus externum, et internum: At si illud quod ego dixi, externum sit, quodnam erit istud internum?"

<sup>57</sup> *Ibid.*, 347: "Ego verbi causa sum res a quinquaginta jam annis durans, agnoscoque me durare eadem duratione, qua omnes coetaneos, qui omnes simul non amplius hactenus duravimus, quam unus, neque enim a nostro exortu fluxere tot illae annorum myriades, quae supputari possent, si toties seipsis quinquaginta addereatur, quot quinquagenarii jam sumus: at internum tempus, quod mihi peculiare sit, et quod praeter externum illud tibi vocatum in abstracto, mihi in concreto conveniat, neque agnosco, neque a te addisco."

The question of how the various internal times of men's lives relate to one another and to external time was one that theorists of internal and external time such as D'Abra de Raconis explicitly addressed.<sup>58</sup> Within this late Aristotelian textbook discourse, it was generally felt that one of the main functions of external time was to act as a measure and a means of uniting and comparing different internal times. However, on the evidence of the passage from Meditation Three, Descartes seemed at this stage more interested in duration as an attribute of bodies (what Gassendi called internal time) than in its 'external' counterpart, so Gassendi was in a sense responding to his opponent's priorities here. However, Gassendi was ultimately unwilling to admit that time could involve any internal element. Gassendi was extremely sceptical about the explanatory value of internal time or intrinsic duration. In this respect, his position resembled that of the medieval authors opposed by Suárez, who made time a purely extrinsic denomination, although Gassendi of course rejected the notion that time involved a relation to *anything*. His argument with Descartes was based on his assumption that any link between time and individual beings, or between time and existence, is meaningless. What mattered for Gassendi was the concept of time as an abstract flow.

Gassendi's use of the terminology of internal and external time in this debate is interesting and important. It shows not only that, to a critical reader who was familiar with the contemporary scholastic textbook tradition, Descartes' theory of time and duration displayed recognizably Aristotelian elements, but also that he seemed to hold a specific position within the late Aristotelian debate. Moreover, the distinction between the internal and external elements of time that Gassendi found in Descartes also played a significant role in the development of his own theory of time. He developed the sketch offered in his dispute with Descartes further in the formal presentation of his natural philosophy, the *Syntagma Philosophica* (1658). The *Syntagma*, Gassendi's Epicurean project, was a gargantuan exercise in both humanist textual criticism and philosophical polemic, in which he attempted to reconstruct and set in context Epicurus' philosophical system, presenting it as a viable alternative to Aristotelianism.<sup>59</sup> The whole

<sup>58</sup> D'Abra de Raconis, *Totius philosophiae*, 360: "Extrinseca vero duratio ea est, qua res per extrinsecam tantum relationem ad rem aliam aliquandiu durare dicitur, ut cum duo homines aequali tempore durasse perhibentur, eo quod, vel eodem tempore nati, eundem aetatis suae annum agunt, vel quod per aequale spatium, verbi gratia, quinquaginta annorum vitam traduxerint, quanquam tamen non eadem extiterint tempestate."

<sup>59</sup> Bernard Rochot, *Les Travaux de Gassendi sur Epicure et sur l'Atomisme, 1619–1658* (Paris: Vrin, 1944).

enterprise took more than 20 years, for although the *Syntagma* was published posthumously in 1658, Gassendi had first begun working on Epicurus in the 1630s. Time and space in the *Syntagma* were parallel forms of being that transcended the traditional division of substance and accident.<sup>60</sup> They were wholly independent of corporeal nature, and would still exist if there were no bodies.<sup>61</sup> Similarly, Gassendi conceived of time and space as independent of the soul and thought, so that “when the Intellect either thinks, or does not think, both Space remains, and Time also continues to flow.”<sup>62</sup> What Gassendi essentially rejected in the *Syntagma* was any notion that space and time were particular or subjective.<sup>63</sup> This point was reinforced in his discussion of the nature of time, where he argued that even if there are many individual subjects or motions, because time is unique and independent of these particular things, there cannot be as many times as there are motions or bodies.<sup>64</sup> This argument was combined with a criticism of internal and external time formulated in very similar terms to that of the *Disquisitio*, although this time Gassendi did not mention Descartes by name, and tailored his argument more apparently towards the position of other scholastic authors:

Perhaps you distinguish, as it is usual to do, internal time from external; for as you say that the particular motions of inferior things have internal and particular times, and that besides this an external and common time (that is to say a time of the first mover) corresponds to them; thus firstly you say that a particular time corresponds to every motion, and some general time corresponds to all of them; but yet you cannot signify that general time if no general motion, of whose former and latter [parts] we are aware, exists,

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<sup>60</sup> Pierre Gassendi, *Opera omnia*, ed. Nicolao Averanio (6. vols. Florence: Typis Regiae Celsitudinis apud Joannem Catejanum Tartini, & Sanctem Franchi, 1727), vol. I, 160: “Locum, & Tempus generali entis, seu rei in substantiam, & accidentis divisione non comprehendi.” For an overview of Gassendi’s view of time, see Antonia LoLordo, *Pierre Gassendi and the Birth of Modern Philosophy* (Cambridge: Cambridge University Press, 2007), 124–127.

<sup>61</sup> *Ibid.*, 162: “Nobis porro, quia videtur, etsi nulla essent corpora, superfore tamen & Locum constantem, & Tempus decurrens, ideo videntur Locus, & Tempus non pendere a corpore, quasi incorporeae cuiquam substantiae accidentium more inhaereant, sed incorpoream quaedam sunt genere diversa ab iis, quae substantiae dici, aut accidentia solent.”

<sup>62</sup> *Ibid.*, “Ex hoc vero sit ut Locus, & Tempus haberi res verae, entiae realia debeant; quod licet tale quidpiam non sint, quale vulgo habetur aut substantia, aut accidentis; revera sint tamen, neque ab intellectu, ut chimerae dependeant, cum seu cogitet intellectus, seu non cogitet, & Locus permaneat, & Tempus procurrat.”

<sup>63</sup> Olivier Bloch, *La Philosophie de Gassendi: Nominalisme, Matérialisme et Métaphysique* (La Haye, Martinus Nijhoff, 1971), 180: “Quoi qu’il en soit de cette différence de présentation, Gassendi en arrive à une conception du temps qui lui permet de rejeter les définitions apparemment subjectivistes qu’il en trouvait dans Epicure comme dans Aristote.”

<sup>64</sup> Gassendi, *Opera Omnia*, vol. I, 197–8.

nor do any of those particular times of yours exist, unless you admit that ten [different] hours flow together with ten bodies or spheres that move through one hour [sc. of external time], and that one hour flows twice as fast as another when one of two motions is twice as fast as the other.<sup>65</sup>

Gassendi's argument here again addressed the problem of reconciling particular, internal times with some general measure, although this time he focused on the connection between internal time and motion, rather than on the link with being and existence found in Descartes' account.

As I outlined in the Introduction, Gassendi's treatment of time in the *Syntagma* has been seen by modern scholars such as Bernard Rochot as an important chapter in the development of Newtonian 'absolute time'.<sup>66</sup> One aspect of this development that they have largely missed, however, is Gassendi's engagement as a theorist of 'absolute time' with aspects of the late Aristotelian discourse of time and being outlined here. In the case of Gassendi, his debate with Descartes shows not only the relevance of late Aristotelian concepts for the Cartesian theory of time, but also the importance of Gassendi's engagement with the specific language of internal and external time in the development of his own theory of 'abstract' time. Seen in the context of the development of 'absolute' time, the Gassendi–Descartes debate suggests that a particularly strong conception of the dependent nature of time—the notion that internal time relates directly to the existence of individual beings— influenced later theories. The discussions of 'absolute' time in Gassendi's philosophy thus originated not so much in a general opposition to the Aristotelian notion of time as a dependent entity, as on a specific engagement with the polar opposite of absolute time, the notion of particular, internal time and its counterpart, external time.

Gassendi's critique undoubtedly shows that he saw clear links between Descartes' use of the term 'abstract time', his implication that the 'time of an enduring thing' is 'concrete', and the language of internal and external

<sup>65</sup> *Ibid.*, 198: "Forte distingues, ut fieri solet, Tempus internum ab externo; ut enim motus particulareis rerum inferiorum dicas habere tempora interna, & propria, ac praeterea illis convenire tempus externum, & commune, scilicet primi mobilis; ita cuilibet motui primo convenire dices Tempus peculiare, & generale quoddam omnibus: verum neque istud generale Tempus designare poteris, nullo existente generali motu, cuius attendatur prius, & posterius; neque ulla sunt ista tua particularia Tempora, nisi & decem horas fluere admittas, cum decem corpora, seu sphaerae per unam horam movebuntur; & unam horam praeterfluere duplo velocius, quam aliam, cum fuerit unus duorum motuum duplo velocior, quam alias."

<sup>66</sup> Bernard Rochot, "Sur les Notions de Temps et d'Espace." See also Schuhmann, "Zur Entstehung des neuezeitlichen Zeitbegriffs."

time. However, it is important to ask whether Descartes himself thought of the theory of time he outlined in Meditation Three and in his responses to Gassendi in these terms. Bernard Rochot, the modern editor of Gassendi's *Disquisitio Metaphysica*, saw his references to internal and external time as a "scholastic distinction... to which Gassendi endeavours to reduce that which he finds in Descartes, in order to refute both of them."<sup>67</sup> I believe that this is an unnecessarily cynical interpretation. Whilst it is true that Gassendi wanted to refute an argument about time that he found both in Descartes and certain late renaissance Aristotelian authors, it is not clear that in doing so he unfairly elided two distinct positions. For, although Descartes did not use exactly the same terminology as his late Aristotelian contemporaries, he shared many of the same assumptions as Suárez and textbook authors such as Eustachius about the connections between duration, time and the existence of individual beings. Indeed, his debt to the tradition of thinking that time involved internal and external elements is also evident, perhaps even to a greater extent, in the *Principles*. In drawing parallels between Descartes and the scholastic tradition on this question, I think that Gassendi offered an interesting and potentially productive way of reading the Cartesian position on duration and time. As I have already noted, recent scholarship has emphasized the importance of Descartes' engagement with Aristotelian textbook authors, and especially with Eustachius, and it is likely that the *Summa Quadripartita* in fact provided a common reference point for both Descartes' positive exposition and Gassendi's critique of the question of internal and external time.

Roger Ariew's argument about the influence of what he styles the "Scotist position on time" on Descartes is relevant here. I have already argued that some of Ariew's assumptions about the Scotist character of the positions taken by Aristotelian textbook authors such as Eustachius and D'Abra de Raconis need to be reassessed, but his remarks about time in Descartes also need to be considered. Ariew notes that the question of time in Cartesian thought is a difficult one, but, in keeping with the main thrust of his argument, his brief remarks about this question concern the influence of the Scotist-Augustinian position that time does not depend on motion for Descartes.<sup>68</sup> He does not discuss the relevance of

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<sup>67</sup> Gassendi, *Disquisitio metaphysica*, 347n352: "Distinction scolastique... à laquelle Gassendi s'efforce de réduire celle qu'il trouve chez Descartes, pour les repousser toutes deux."

<sup>68</sup> Ariew, *Descartes and the Last Scholastics*, 55n21.

the internal-external time distinction for Descartes' theory of time, and the implications of this aspect of the discourse for the *Meditations* and the *Principles*. So whilst Ariew's instinct about one aspect of this question in Descartes is correct, I suggest that he misses perhaps the most interesting implication of Descartes' debt to the late Aristotelian tradition.

#### *Duration and Time in the Principia Philosophiae*

There are therefore good reasons for believing that the Aristotelian discourse of thinking about time as internal and external is a profitable context in which to read Descartes' position in the debate with Gassendi. The parallels between Descartes and his Aristotelian context were much more apparent, however, in the *Principia*. Descartes explicitly addressed the concepts of internal and external space and place in this text, but the notion that he also engaged with internal and external time has received less scholarly attention.<sup>69</sup> His debt to this tradition is evident in the more formal consideration of the ontology of time in Section One of the *Principia Philosophiae*. The sections devoted to time in the *Principia* were relatively brief, and drew in part on the arguments about time and creation outlined in the Third Meditation, but Descartes did set out more clearly the distinction between duration and time (which was sometimes blurred in his exchange with Gassendi) and, more importantly, engaged with the question of how the mind or soul relates to time. Section 1.21 of the *Principia* essentially reaffirmed the arguments familiar from Meditation Three about the connection between the existence of God, continuous creation and the nature of time. Descartes again argued that "The fact that our existence has duration is sufficient to demonstrate the existence of God."<sup>70</sup> This proof depended on the now familiar argument that the parts of time are essentially independent:

For the nature of time is such that its parts are not mutually dependent, and never coexist. Thus, from the fact that we now exist, it does not follow that we shall exist a moment from now, unless there is some cause—the same cause which is originally produced in us—which continually reproduces us and keeps us in existence.<sup>71</sup>

<sup>69</sup> Descartes, *Philosophical Writings Volume I*, 227–9.

<sup>70</sup> *Ibid.*, 200.

<sup>71</sup> *Ibid.*, 200.

The only conceivable source of this power is, of course, God. This section really did little more than restate the argument of the Third Meditation in the form of a demonstration, but Descartes went on to define the nature of time and duration more specifically in sections 1.55 (“How we can also have a distinct understanding of duration, order and number”) and 1.57 (“Some attributes are in things and others in thought. What duration and time are”).<sup>72</sup>

Both of these sections preserved the connection already established between duration and existence, but they also made it clear that the soul or mind, and specifically the ability to conceive or think of something, is essential to understanding the nature of both duration and time. Descartes argued that duration is in no way connected to substance, but instead “we should regard the duration of a thing simply as a mode under which we conceive the thing insofar as it continues to exist.”<sup>73</sup> As he explained, a mode is simply an attribute or quality; although in this case “that which always remains unmodified—for example existence or duration in a thing which exists or endures—should be called not a quality or a mode but an attribute.”<sup>74</sup> Some attributes, Descartes argues, are either “in the very things of which they are said to be attributes or modes, while others are only in our own thought.”<sup>75</sup> Whilst he implies that duration is in “the very things” of which it is an attribute by virtue of its connection to existence, time (*tempus*) is a purely mental construct:

For example, when time is distinguished from duration taken in the general sense and called the number of motion (*numerum motus*), it is simply a mode of thought (*modus cogitandi*). For the duration which we understand to be involved in movement is certainly no different from the duration involved in things that do not move . . . But in order to measure the duration of all things, we compare their duration with the duration of the greatest and most regular motions which give rise to years and days, and we call thus duration “time”. Yet nothing is thereby added to duration, taken in its general sense, except for a mode of thought.<sup>76</sup>

Duration “taken in the general sense” is a thing’s continued existence, and although it is a mode of a particular substance, it is nevertheless a quality

<sup>72</sup> *Ibid.* 200. In the Latin version, this was rendered as “Quaedam attributa esse in rebus, alia in cogitatione. Et quid duratio & tempus.”: Descartes, *Oeuvres*, vol. VIII, 26–7.

<sup>73</sup> *Ibid.*, 211.

<sup>74</sup> *Ibid.*, 212.

<sup>75</sup> *Ibid.*, 212.

<sup>76</sup> *Ibid.*, 212. I have slightly emended the translation here.

that is really in that substance—that is, its continued existence. However, time is simply a way of thinking about the many different individual durations in terms of measurement. This division between the particular duration of individual things, and a general description of “the duration of all things” that involves comparing “their duration with the duration of the greatest and most regular motions which give rise to years and days” bears a very strong resemblance to the textbook discussions of internal and external time. Descartes’ concept of duration resembled ‘internal time’ in many respects; certainly, most of the Aristotelian authors I discussed earlier equated internal time with duration or continued existence.

Similarly, like the external time of textbook authors such as Eustachius, Descartes’ concept of ‘time’ was a purely rational construct, dependent on celestial motion, that enables us to compare particular durations. Although the terminology that Descartes used to describe time (*modus cogitandi*) is distinctive, it made time a mental, mind-dependent entity in the same way as the descriptions of time as a rational being (*ens rationis*) familiar from many late Aristotelian natural philosophy textbooks. Like the late Aristotelian discussions of external time, Descartes made ‘time’ a purely rational construct, although unlike them he argued that it ‘added nothing’ to duration other than a ‘mode of thought’; most discussions of external time made it rational, but saw its role in comparing and uniting different internal times as an important aspect of any account of time, rather than simply a redescription of its essential nature. So although he used a version of the concepts of internal and external time, Descartes’ primary focus was on the sense in which duration related to the existence of individual beings.

In broader terms, then, the ontology of time developed by Descartes in the *Meditations*, in his debate with Gassendi and in the final statement of his natural philosophy and metaphysics in the *Principia* not only exhibited recognisably Aristotelian characteristics, but, more specifically, it resembled the argument advanced by authors such as Eustachius and Suárez, whom Descartes is known to have read, and also by widely-known European textbook authors such as Timpler, Keckermann and their French contemporaries such as D’Abra de Raconis (to whom Descartes referred in his correspondence with Mersenne) and René de Ceriziers. The presence of these arguments about ‘internal’ and ‘external’ time in Descartes indicates not merely the potential influence of Scotism on his philosophy of time, as Ariew suggests, but rather a broader connection to the theories of how the soul and the human subject exist and orient themselves in

time developed by some of these authors. As I have argued, in the early to mid-seventeenth century the argument, originally found in the *Categories* commentary tradition and in Suárez, and developed by some late Aristotelians, that time and duration are closely connected to the existence of individual beings had become linked to a way of thinking about how the soul and the subject exist in time. The presence of these Aristotelian themes in Descartes offers another perspective on the shift that he is credited with making in concepts of the soul and the subject. To the 'creation of the mental' that some scholars ascribe to Descartes, and the reliance that others have noted on Augustinian and neo-Platonic notions of the subject, we can perhaps add a new and slightly unfamiliar move—his use of the temporal. The presence of themes drawn from Aristotelian accounts of temporality identified here certainly adds an important element not only to accounts of time in Descartes, but also to the broader problems of the subject and the soul in Cartesian philosophy.

It also offers a way of making sense of the Meditator's contention at the beginning of Meditation Three that his clear and distinct ideas of duration may be 'borrowed' from 'my idea of myself', an argument that Jean-Luc Marion has termed the 'egological deduction' of duration.<sup>77</sup> Self-awareness and self-reflection—that is, my awareness that I have existed, and that I currently exist—underpinned Descartes' later assertions about the connection between duration and existence. For, in the *Principia*, time is a *modus cogitandi*, a mind-dependent construction of my thought, and duration can also be seen as in a way personal, since Descartes insists on the primacy of the idea of duration derived from myself, my body and my soul. The connection between duration and existence was accented in a way that emphasized the importance of duration and time to Descartes' conception of the subject—the Meditator always refers to 'my' current existence and 'my' memory of past existence—and this accent was also discernable in his later discussions of time. Essentially, Descartes' discussions of the ontology of time were always accompanied by an awareness of how the human subject orients itself in time.

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<sup>77</sup> Jean-Luc Marion, *On Descartes' Metaphysical Prism: The Constitution and Limits of Onto—Theo—Logy in Cartesian Thought*, transl. Jeffrey L. Kosky (Chicago: University of Chicago Press, 1999), 182.

*Descartes' Psychology of Time*

Together with his rejection of qualities and forms in natural philosophy, one of the best-known features of Descartes' attempt to transcend late renaissance Aristotelianism was his rejection of some of the central tenets of Aristotelian psychology. This move has been analyzed and described in many ways, but its key features were his mechanization of the body, and with it most of the functions that Aristotelian philosophy ascribed to the vegetative and sensitive souls, and his move to separate absolutely the two elements of *res extensa*, body, and *res cogitans*, the incorporeal soul.<sup>78</sup> Whereas for the late Aristotelian authors I have discussed, the soul was not only the substantial form of the body, but also intimately connected to its functions, for Descartes the body was simply a machine, matter in motion. The bodies of animals and plants, and also of humans, were machines whose operations could not be described in terms of any spiritual power. The lower functions of the Aristotelian soul were therefore mechanized for Descartes.

Descartes' refiguring of the soul had obvious and important implications for the 'psychology of time' I described in Chapter Two. Clearly, he rejected many of the positions and assumptions that underpinned the late Aristotelian account of how the soul existed and oriented itself in time. In particular, he jettisoned the formal division between the atemporality of the intellect and the temporal nature of the sensitive soul together with the tripartite division of the soul itself. Aristotelian debates about the temporality of animals were also largely meaningless to him. It is also true that he was less inclined than most late Aristotelian authors to describe the operation of various mental powers using the language of time and duration. However, I argue that Descartes was in fact interested in at least two issues also found in the late Aristotelian psychology of time: firstly, the idea that a theory of the connection between time and the soul can be an account of how the human subject operates in time, and secondly the complex series of questions surrounding time and thought. I have already suggested that the connection made between time and our existence in the *Meditations* and the *Principles* indicated a concern with the place of the subject in time, but Descartes' most important move in this respect was his argument that the same concept of duration applied

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<sup>78</sup> Des Chene, *Life's Form*, and Dennis Des Chene, *Spirits and Clocks: Machine and Organism in Descartes* (Ithaca: Cornell University Press, 2001).

equally to body and soul. This was a position implied in some discussions of internal and external time although, as we have seen, the typical late Aristotelian position was that the duration of the separated, eternal intellectual soul was *aevum*, whereas the body and the vegetative and sensitive souls endured in time (*tempus*). These authors therefore had to argue that one aspect of the soul, the intellect, essentially operated (that is, thought, willed or remembered) in a different time from that in which it endured. Authors such as Timpler, however, moved towards, although never fully substantiated, an ontology of time in which the internal time of a subject accounted for the life of its body and whole soul: that is, a theory of the subject in time. Although he wrote from a different perspective in some respects, Descartes also presented an account of how the human subject conceived of as body and soul existed in time, which began with the notion that both *res extensa* and *res cogitans* shared one duration.

This was an argument found from the beginning of his philosophy. As early as Rule Twelve of the *Regulæ*, Descartes had stated that duration, like existence, was one of the 'common natures' that are predicated of souls as much as of bodies.<sup>79</sup> This was a position that he repeated in 1643 his correspondence with Princess Elizabeth, where he reiterated the argument from the *Meditations* that duration is one of the 'primitive notions,' "which are as it were the patterns on the basis of which we form all our other conceptions."<sup>80</sup> Duration, he went on to argue, is one of the most general primitive notions, "which apply to everything we can conceive": that is, to both body and soul.<sup>81</sup> Similarly, the passage in the *Principles* where Descartes argued that duration applies equally to mobile and non-mobile things was another statement of this point. Making duration a common link between body and soul in this way represented an attempt to describe how a subject composed of body and soul could exist in time from the perspective of ontology: it was an argument that began with an account of the nature of time.

This aspect of Descartes' position on duration and the soul was criticized by the Jansenist theologian and philosopher Antoine Arnauld, author of the *Fourth Objections* and also of a series of letters to Descartes in which he challenged his positions on a number of issues. Unlike Gassendi, Arnauld was generally sympathetic to much of the Cartesian

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<sup>79</sup> Descartes, *Philosophical Writings Volume I*, 45.

<sup>80</sup> Descartes, *Philosophical Writings Volume III*, 218.

<sup>81</sup> *Ibid.*, 218.

philosophical project, but he criticized many of the assumptions made in the *Meditations* about how the duration of the soul itself could be conceived. In his anonymous letter dated 3 June 1648, Arnauld returned to the third proof of God's existence in the *Meditations*, where Descartes argued for the connection between continuous creation and the nature of time. Arnauld questioned the meaning of time in this passage.<sup>82</sup> Like Gassendi, he found in this passage an unclear or unsatisfactory statement about the nature of time. Arnauld distinguished here between two forms of time, the duration of the mind or soul, and time in its proper signification, which he defined as the duration of motion. If, he noted, in this passage it is "the duration of the mind itself, that you call time, Philosophers and Theologians commonly deny that the duration of permanent and especially of spiritual things, of which kind the mind is, is successive, but [they argue that] it is permanent, and simultaneous (which indeed is most certain of the duration of God)."<sup>83</sup> This was of course a reference to the classic scholastic position that *aevum*, or non-successive duration, was the duration of angels and of the rational soul. Arnauld then noted that if Descartes was indeed thinking of time in its proper signification, "that is, of the duration of motion, as of the sun and of the remaining stars, this seems in no way to pertain to the conservation of our mind."<sup>84</sup> Thus, Arnauld insisted, for the demonstration of the existence of God to convince, it is necessary that Descartes explain four problems in this text, of which the first three are the most relevant here:

1. What is duration, and in what way is it distinguished from the enduring thing?
2. Whether the duration of a permanent and spiritual thing is successive or permanent?
3. What is time in the proper sense, and in what way does it differ from the succession of a permanent thing, if both things are successive?
4. From where does time get its brevity and length, and from where does motion get its slowness and speed?<sup>85</sup>

<sup>82</sup> Descartes, *Oeuvres*, vol. V, 188: "Sed quaeri potest, de quo tempore hic agatur."

<sup>83</sup> *Ibid.*, 188: "Si enim de ipsis mentis duratione, quam tempus appellas, negant vulgo Philosophi ac Theologi, rei permanentis & maxime spiritualis, qualis mens est, durationem esse successivam, sed permanentem, & totam simul (quod quidem de Dei duratione certissimum est)..."

<sup>84</sup> *Ibid.*, 188–9: "Quod si respondeas, te etiam de tempore proprio dicto loqui, quod est de duratio motus, ut solis et reliquorum astrorum, nihil hoc ad mentis nostrae conservationem pertinere videtur..."

<sup>85</sup> *Ibid.*, 189: "Quare, ut haec demonstratio eandem, quam reliquae, vim habet, opus esset ut exponeres: 1. Quid sit duratio, & quomodo distinguitur a re durante? 2. Utrum

Arnauld's first three questions were clearly influenced by the mainstream scholastic debate about time and duration. Specifically, his first three questions touched on several important late Aristotelian debates. His first point, which resembled one of Gassendi's queries about the nature of the distinction between duration and the enduring thing, echoed Suárez and other commentators; again, Descartes' own argument in the *Principles* suggested that he assumed only a rational distinction between them. Arnauld's second question seems directed at issues surrounding the distinction between the duration of the soul, and that of the body, in an attempt to separate out the two concepts elided by Descartes. His third numbered point was again aimed at delineating time from *aevum*, and therefore related to Descartes' definition of time itself. Arnauld's concern here was really with Descartes' departure from the mainstream Aristotelian ontology of time, rather than with the 'psychology of time' or the role played by time within mental processes.

It is not clear whether Arnauld received a response that satisfied him. Descartes replied in a letter dated 4 June 1648, noting that "What is said about duration and time rests on the scholastic opinion, with which I strongly disagree, that the duration of motion is of a different kind from that of things which are motionless. I have explained this in Article 47 of Part One of the *Principles*."<sup>86</sup> On one hand, Descartes explicitly distanced himself from aspects of the scholastic position on time. For all the consonance between other aspects of his account with late scholastic assumptions, it is important to acknowledge the extent to which Descartes also attempted to transcend late Aristotelian concepts of time. Descartes' initial response was thus to reiterate the ontological argument that duration relates both to bodies and souls. However, he also formulated a response that considered how our mental life might inform any account of the nature of time itself. Descartes attempted to counter Arnauld's argument that spiritual duration is fundamentally non-successive (and thus that his position was anti-scholastic) with reference to the operation of 'the human mind' itself: that is, with an argument apparently grounded as much in the psychology of time, as in its ontology. He went on to argue that:

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rei permanentis ac spiritualis duratio successiva sit an permanens? 3. Quid sit proprius tempus, & in quo a rei permanentis successione differat, si utraque res successiva sit? 4. Unde tempus suam brevitatem aut longitudinem sortiatur, & unde motus suam tarditatem aut velocitatem?"

<sup>86</sup> Descartes, *Philosophical Writings Volume III*, 355.

Even if no bodies existed, it could still not be said that the duration of the human mind was entirely simultaneous like the duration of God; because our thoughts display a successiveness which cannot be found in the divine thoughts. We clearly understand that it is possible for me to exist at this moment, while I am thinking of one thing, and yet not to exist at the very next moment, when, if I do exist, I may be thinking of something quite different.<sup>87</sup>

Descartes' response reaffirmed his familiar argument that existence is essentially discontinuous, and thus requires continual re-creation by God, but tied it more closely to the role of time in the mind, since it is the operation of thought in the mind over time and the potential discontinuity of thought that makes us aware of the discontinuity of existence. It is also an important statement of his belief that temporal sequence structured our thoughts. This brief response, which was part of a longer letter, did not amount to a detailed defence of Descartes' position on duration and time, but in many respects it indicates the trajectory of his argument.

Arnauld's response to these points in his letter dated July 1648 was also brief. He noted that "As for what pertains to duration, I read the reference noted by you, and it greatly pleased me, although I do not yet grasp why former and latter, which must be found in all succession, must be found in the successive duration of non-mobile things."<sup>88</sup> Quite how satisfied Arnauld actually was by the passage in the *Principles* is uncertain. Descartes, however, responded again to his uncertainty about the difference between the duration of mobile and non-mobile objects, extension and soul. In his letter dated 29 July 1648, he again insisted that the duration of moving objects and that of objects at rest is identical: "I understand the successive duration of things in motion, and of the motion itself, no differently from that of things that are not in motion; for earlier and later in any duration are known to me by the earlier and later of the successive duration which I detect in my own thought, with which the other things co-exist."<sup>89</sup> Again, Descartes asserted the primacy of a notion of duration and time based on the operations of the soul or mind: in human experience, he suggested, the original of time is always found in the soul. This passage is important and suggestive because it connected the notion that

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<sup>87</sup> *Ibid.*, 355.

<sup>88</sup> Descartes, *Oeuvres*, vol. V, 215: "Quod ad durationem attinet, locum inspexi a te notatum, mihiique maxime placuit, quamvis nondum capiam, unde prius et posterius, quod in omni successione reperiiri debet, in duratione successiva rei non motae desumendum sit."

<sup>89</sup> Descartes, *Philosophical Writings Volume III*, 358.

bodily and spiritual duration are identical with the role of our soul in *understanding* duration. Our thoughts lead us to understand time as we exist in time as a union of body and soul.

The debate between Descartes and Arnauld ended here, although some of its themes were picked up by later authors such as Desgabets and Cardinal Retz.<sup>90</sup> What emerged in their relatively brief discussion was an unresolved conflict between the conventional scholastic view of duration espoused by Arnauld and Descartes' modified version of the idea that body and soul conceived together as a subject endure in one form of time. For all Descartes' apparent and professed anti-scholasticism, the Arnauld-Descartes correspondence also indicated two positions that were in a way already present in late Aristotelian thought on time and the soul confronting each other.

If this discussion with Arnauld considered the connection between the soul and time primarily in terms of how the operation of the soul might explain the nature of time, there were instances elsewhere in Descartes' responses to his critics that showed him engaging directly with the other aspect of this discourse—the role of time in our mental life. They chiefly involved the connections between time and thought: in late Aristotelian terminology, these were issues surrounding time and the intellect. Sometime these engagements were fragmentary, but they indicate that Descartes was often forced to reflect on how to distance himself from scholastic positions on these issues.

Questions from the Aristotelian psychology of time formed part of Descartes' *Interview with Burman*. This manuscript, although first published only in 1896, is an account of Descartes' position in a conversation with the Dutch student Franz Burman at his house in Egmond Binnen on 16 April 1648. Burman's account of the conversation comprised a series of quotations from Descartes' published work, each followed either by a reported interchange between him and Descartes, or simply by Descartes' response.

The section that addresses time and sequence in the mind began with a quotation from the *Fourth Replies* (directed at Arnauld), where Descartes denied that his argument that clear and distinct perceptions are guaranteed by God was circular. Burman attacked this point on the basis that

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<sup>90</sup> Geneviève Rodis-Lewis, "L'âme et la Durée d'après une Controverse Cartésienne," *Revue Internationale de Philosophie* 4:12 (1950): 190–209; Tad Schmaltz, *Radical Cartesianism: The French Reception of Descartes* (Cambridge: Cambridge University Press, 2002).

'the author' uses 'axioms' to prove the existence of God, even though he is not at this point certain of their truthfulness.<sup>91</sup> Descartes responded that "He does use such axioms in the proof, but he knows that he is not deceived with regard to them, since he is actually paying attention to them. And for as long as he does pay attention to them, he is certain that he is not being deceived, and he is compelled to give his assent to them."<sup>92</sup> Burman's response to this argument introduced the notion of time and the instantaneous nature of thought into the debate:

But our mind can think of only one thing at a time, whereas the proof in question is a fairly long one involving several axioms. Then again, every thought occurs instantaneously, and there are many thoughts which come to mind in the proof. So one will not be able to keep the attention on all of the axioms, since any one thought will get in the way of another.<sup>93</sup>

Burman's intention here was primarily to challenge the idea that the mind can attend to all the proofs of God's existence at the same time, rather than in sequence, which it must do to avoid the challenge of circularity. However, he also raises an interesting point about the role of temporal sequence in the mind. John Cottingham believes that Burman's point in this passage contains a 'simple empirical error' about the nature of thought, provoked by his uncertainty about whether Descartes intended thoughts (*cogitationes*) as the durationless objects of thought, or as examples of the mental process of thought.<sup>94</sup> But it is also possible that his position owed something to the late Aristotelian debates about the temporality of thought discussed earlier, in which it was not so absurd to argue that one could only keep one thought in mind at a time. Descartes' response elaborated on his notion that time and succession are necessarily involved in thought. He argued that,

Firstly, it is just not true that the mind can think of only one thing at a time. It is true that it cannot think of a large number of things at the same time, but it can still think of more than one thing. For example, I am now aware and have the thought that I am talking and that I am eating; and both these thoughts occur at the same time.<sup>95</sup>

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<sup>91</sup> Descartes, *Philosophical Writings Volume III*, 334.

<sup>92</sup> *Ibid.*, 334.

<sup>93</sup> *Ibid.*, 334–5.

<sup>94</sup> René Descartes, *Descartes' Conversation with Burman*, transl. John Cottingham (Oxford: Clarendon Press, 1976), 58–9.

<sup>95</sup> Descartes, *Philosophical Writings Volume III*, 335.

He went on to argue that, "Thus, secondly, it is false that thought occurs instantaneously; for all my acts take up time, and I can be said to be continuing and carrying on with the same thought during a period of time."<sup>96</sup> Descartes thus asserted a model of thought as temporal (that is, occurring in time), enduring over time and successive. To this argument, Burman noted that, "But on that showing, our thought will be extended and divisible."<sup>97</sup> This, of course, would make thought like an attribute of the body, which, although he agrees that time and duration are predicated of both *res extensa* and *res cogitans*, Descartes rejected. Indeed, he argued that whilst

Thought will indeed be extended and divisible with respect to its duration, since its duration can be divided into parts. But it is not extended and divisible with respect to its nature, since its nature remains unextended. It is just the same with God: we can divide his duration into an infinite number of parts, even though God himself is not therefore divisible...<sup>98</sup>

Just because thought operates in time and is temporal, it is not necessarily extended. Although duration relates to the existence of thought and the soul, just as it does to existence of the body, its existence is of course not identical with its essential nature. Descartes ended this part of the conversation by asserting that, based on his arguments for the mind's ability to think temporally and sequentially in this way, his proof still stands:

Accordingly, since our thought is able to grasp more than one item in this way, and since it does not occur instantaneously, it is clear that we are able to grasp the proof of God's existence in its entirety. As long as we are engaged in this process, we are certain that we are not being deceived, and every difficulty is thus removed.<sup>99</sup>

The argument that the mind can think of more than one thing at once also reappeared in the next section of the *Interview*, which dealt with the notion of the mind's self-awareness, or capacity for reflexive thought, taken from Descartes' *Fourth Replies*. The relevant passage here was "The fact that there can be nothing in the mind insofar as it is a thinking thing, of which it is not aware, seems to me to be self-evident."<sup>100</sup> Here, Burman again used the assumption that individual thoughts are instantaneous and

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<sup>96</sup> Descartes, *Philosophical Writings Volume III*, 335.

<sup>97</sup> *Ibid.*, 335.

<sup>98</sup> *Ibid.*, 335.

<sup>99</sup> *Ibid.*, 335.

<sup>100</sup> *Ibid.*, 335.

in a sense mutually exclusive to criticize Descartes' notion of reflexive thought, asking,

But how can it [i.e. the mind] be aware, since to be aware is itself to think? In order to have the thought that you are aware, you must move on to another thought; but if you do this, you can no longer be thinking of the thing you were thinking of a moment ago. It follows that you cannot be aware that you *are* thinking, but only that you *were* thinking.<sup>101</sup>

Burman denied that genuinely reflexive thought, which is located in the present, is possible. As the mind can only hold one thought at a time, he suggested, the mind's awareness of itself must instead be a function of memory, and involve only past events. Descartes' reported response here was consistent with his earlier position. After noting that "It is correct that to be aware is both to think and to reflect on one's thought," he argues that there is nothing in the mind to rule out multiple simultaneous thoughts. Burman, he argued, was again wrong to assume that the mind holds only one thought at a time: "But it is false that this reflection cannot occur while the previous thought is still there. This is because, as we have already seen, the soul is capable of thinking of more than one thing at the same time, and of continuing with a particular thought which it has."<sup>102</sup> Consequently, "It has the power to reflect on its thoughts as often as it likes, and to be aware of its thoughts in this way..."<sup>103</sup> This aspect of reflexive thought for Descartes was essentially an activity founded on the ability of the mind to think temporally—to hold onto thoughts, and to attend to more than one thought at once. This was a theory of the connection between time and reflexive thinking that was far less complex than the late Aristotelian model discussed in Chapter Two, and one in which the soul could apparently reflect on itself directly in time.<sup>104</sup>

The conversation with Burman also addressed the problem of intellectual memory, in a discussion that also touched on the familiar late Aristotelian question of whether the mind always thinks. The discussion again originated in the passage in Arnauld's *Fourth Objections*, where he argued that the mind of a baby in the womb represented a case where one could have thoughts of which one was unaware, and thus that "there may be many things in the mind of which we are unaware."<sup>105</sup> Descartes

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<sup>101</sup> *Ibid.*, 335.

<sup>102</sup> *Ibid.*, 335.

<sup>103</sup> *Ibid.*, 335.

<sup>104</sup> Maclean, "Language in the Mind," 299.

<sup>105</sup> *Ibid.*, 150.

had responded by arguing that “we cannot have any thought of which we are not aware at the very moment when it is in us”; therefore an infant is immediately *aware* of its thoughts, even if it does not remember them later.<sup>106</sup> Burman noted that, to Arnauld, this suggested that “the mind must always be thinking, even in the case of infants”, a position to which Descartes assented, both in the debate with Burman and in a letter to Arnauld himself.<sup>107</sup> In his correspondence with Arnauld, Descartes suggested that “it seems necessary that the mind should always be engaged in thinking; because thought constitutes its essence, just as extension constitutes the essence of a body. Thought is not conceived as an attribute which can be present or absent like the division of parts, or motion, in a body.”<sup>108</sup> The parallel here with late Aristotelian debates is interesting. In his debate with Burman, Descartes noted that although we may not remember particular thoughts, due to a failure of imprinting in the brain, the mind “cannot be without *some* thought”, just as the body can never lack extension.<sup>109</sup> Burman’s response to this was the classic Aristotelian point that, even if bodily memory failed, “there still exists an intellectual memory, as is undoubtedly the case with angels or disembodied souls, for example. And this intellectual memory ought to enable the mind to remember its thoughts.”<sup>110</sup> Descartes’ position on intellectual memory was similar in some respects to that of his Aristotelian contemporaries:

I do not refuse to admit intellectual memory: it does exist. When, for example, on hearing that the word ‘K-I-N-G’ signifies supreme power, I commit this to my memory and then subsequently recall the meaning by means of my memory, it must be the intellectual memory that makes this possible. For there is certainly no relationship between the four letters (K-I-N-G) and their meaning, which would enable me to derive the meaning from the letters. It is the intellectual memory that enables me to recall what the letters stand for. However, this intellectual memory has universals rather than particulars as its objects, and so it cannot enable us to recall every single thing we have done.<sup>111</sup>

The phenomenon of intellectual memory was one that Descartes had considered since the early 1640s. He described intellectual memory in a letter to Mersenne of 6 August 1640 as “altogether spiritual, and... not found in

<sup>106</sup> *Ibid.*, 171–2.

<sup>107</sup> Descartes, *Philosophical Writings Volume III*, 336.

<sup>108</sup> *Ibid.*, 355.

<sup>109</sup> *Ibid.*, 336.

<sup>110</sup> *Ibid.*, 336.

<sup>111</sup> *Ibid.*, 336–7.

animals. It is this that we mainly use," and in correspondence with Huygens he noted that intellectual memory survives with the separated soul.<sup>112</sup> As for many of his contemporaries, supporting the notion of an intellectual memory was a theological imperative, but it also represented Descartes' engagement with the terminology of the late Aristotelian account of how the soul oriented itself in time. What emerges from all of these engagements with his critics, though, is a sense that understanding how all the aspects of our mental life exist and operate in time was not his highest priority; although he engaged with many of these positions, the main focus of his account of time and the soul was ontological, and centred on a concept of the subject. In this respect, as in many others, he self-consciously swam against one current of late Aristotelian thought whilst using many of the Aristotelians' most familiar strokes.

### *Time and the Passions of the Soul*

Another area in which Descartes took the connection between time and the soul seriously was the connection he drew between the passions of the soul and the soul's temporal nature. His last philosophical work, the *Les Passions de l'Ame* (1649), contained a sustained discussion of how our passions operate in, and are ordered by, time. In treating the passions, Descartes intervened in a rich and sophisticated contemporary discourse. Passions were commonly held to be states of the soul, but they also produced bodily effects such as trembling or blushing. Early modern theories of the passions were fundamentally explanations of how we engage with and react to objects in the external world, but they were built on an understanding of the different nature of individual subjects. Most early modern authors believed that each person had a particular passionate constitution that was produced by their upbringing, experience and by many other factors, and which was more or less unique to them. Discussions of the passions thus included both a general classification of the different passions and their nature, and an understanding of the way they operated in individuals. As a result, the discourse of the passions in early modern philosophy was a complex entity, dealing not only with psychological themes, but also with moral and political questions. Many authors saw the study of the passions as involving natural, moral and civil philosophy

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<sup>112</sup> *Ibid.*, 151, 216; also his letter of August 1641 to Hyperaspistes, *Ibid.*, 190.

together, since considering this topic involved not simply understanding the nature of the passions, but also reasoning about how to control them.<sup>113</sup> As the English Jesuit author Thomas Wright put it, “the Divine, the Philosopher, the curers both of the body and the soul . . . the good Christian that attendeth to mortification, and the prudent civil Gentleman” were all concerned with these questions.<sup>114</sup>

There was a kind of structural similarity between time, duration and passion for Descartes. Just as duration was a kind of common notion that was predicated of both body and soul, *Les Passions de l'Ame* made the passions of the soul into a way of understanding the interaction between the two elements. For Descartes, time was both a way of categorizing and distinguishing different passions according to the sphere of their operation, and also a means of explaining their action. He placed more emphasis on the role of time in distinguishing and categorizing the passions, though, and was seemingly less concerned with the pathological and political possibilities that exercised some of his contemporaries.

Descartes began his account in Part Two of the *Passions* with the passions that he considered to be essentially atemporal; or, rather, those which are generally located in the present, but in which he claimed the concept of time has little explanatory force. The first of all the passions is wonder: “When our first encounter with some object surprises us and we find it novel, or very different from what we formerly knew or from what we supposed it ought to be, this causes us to wonder and be astonished at it.”<sup>115</sup> Wonder is the ‘first of all the passions’ because it is essentially independent of any sense of good or evil stemming from its object. As Descartes put it, it is primary because “all of this may happen before we know whether or not the object is beneficial to us.”<sup>116</sup> Although he did not formally invoke the notion of time here, it is important to note that wonder seems to be a passion located in the present, but which also needs to be understood in the context of our memory of the past, because we wonder at an object that in some way contradicts our stored past impressions. Wonder, Descartes argued, may also be joined to “either esteem or contempt, depending on whether we wonder at the value of an object

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<sup>113</sup> See Susan James, *Passion and Action: The Emotions in Seventeenth-Century Philosophy* (Oxford: Oxford University Press, 1997), 1–2.

<sup>114</sup> Thomas Wright, *The Passions of the Mind in General*, ed. William Webster Newbold (New York: Garland, 1986), 89.

<sup>115</sup> Descartes, *Philosophical Writings Volume I*, 350.

<sup>116</sup> *Ibid.*, 350.

or at its insignificance."<sup>117</sup> Esteem or contempt directed on ourselves "gives rise to the passions of magnanimity or vanity and humility or abjectness, and then to the corresponding habits."<sup>118</sup> When esteem or contempt are directed externally, however, "upon some other object that we regard as a free cause capable of doing good and evil, esteem becomes veneration and simple contempt becomes scorn."<sup>119</sup> In both of these cases, though, the resulting passions can begin with the present act of reflection on and comparison with past events that forms an important part of the passion of wonder. It seems that even those passions in which Descartes did not formally invoke time contained temporal elements, and clearly operated in time.

A key break identified by Descartes in his typology of the passions centred on the notion of an object's potential to do good or evil. As he argued, "All the preceding passions may be produced in us without our perceiving in any way whether the object causing them is good or evil."<sup>120</sup> The twin passions of love and hatred, however, differ from wonder and its associated passions in that "... when we think of something as good with regard to us, i.e. as beautiful to us, this makes us have love for it; and when we think of it as evil or harmful, this arouses hatred in us."<sup>121</sup> The perception of an object's good or evil effects upon us is a central feature of all the other passions apart from wonder, but what distinguishes them is their relationship to time. Descartes argued that "The same consideration of good and evil is the origin of all the other passions. But in order to put them in order I shall take time into account; and seeing that they lead us to look much more to the future than to the present or the past, I begin with desire."<sup>122</sup>

Desire for Descartes obviously "... always concerns the future. This holds true in every case involving desire—not only when we desire to acquire a good which we do not yet possess or to avoid an evil which we judge may occur, but also when we merely wish for the preservation of a good or the absence of an evil."<sup>123</sup> Thus desire seems to involve two related kinds of orientation towards the future—it can involve both looking to the future in order to acquire or avoid an object, and desiring in the present that a positive or negative state of affairs will endure into the

<sup>117</sup> *Ibid.*, 350.

<sup>118</sup> *Ibid.*, 350.

<sup>119</sup> *Ibid.*, 350.

<sup>120</sup> *Ibid.*, 350.

<sup>121</sup> *Ibid.*, 350.

<sup>122</sup> *Ibid.*, 350.

<sup>123</sup> *Ibid.*, 350.

future. Later in Part Two of the *Passions*, Descartes offered a more precise definition of desire, arguing that it is

an agitation of the soul caused by the spirits, which disposes the soul to wish, in the future, for the things it represents to itself as agreeable. Thus we desire not only the presence of goods which are absent but also the preservation of those which are present. In addition we desire the absence of evils, both those that already affect us and those we believe we may suffer on some future occasion.<sup>124</sup>

Desire, he suggested, has no opposite (a position in opposition to the scholastic model that opposed desire to aversion), and it may also be distinguished “into as many different species as there are different objects that we pursue.”<sup>125</sup> What unites these different species of desire is their common concern with the future, considered both in terms of situations enduring into the future, and of attaining or avoiding future objects.

Descartes’ assertion that the remaining passions “lead us to look much more to the future than to the present or the past” was borne out in the group of passions that he associated with the relative probability of future objects—that is, “hope, anxiety, jealousy, confidence and despair.” Whereas the assessment of the future involved in desiring merely leads us to speculate on whether it is possible to attain or avoid an object, this group of passions provokes a more sophisticated assessment of future probability. Thus

We are prompted to desire the acquisition of a good or the avoidance of an evil simply if we think it possible to acquire the good or avoid the evil. But when we go beyond this and consider whether there is much prospect of our getting what we desire, then whatever points to the former excites hope in us, and whatever points to the latter excites anxiety (of which jealousy is one variety).<sup>126</sup>

The extreme version of hope “changes its nature and is called ‘confidence’ or ‘assurance’, just as, on the other hand, extreme anxiety becomes despair.”<sup>127</sup> Of course, the notion of hope being oriented towards the future was a standard trope in the contemporary literature on the passions, but the idea that it essentially represents a more considered approach to future objects than desire was perhaps less typical.

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<sup>124</sup> *Ibid.*, 358–9.

<sup>125</sup> *Ibid.*, 359.

<sup>126</sup> *Ibid.*, 350–1.

<sup>127</sup> *Ibid.*, 351.

Whilst the group of passions associated with hope relates to objects or events beyond our control, Descartes also discussed another group (irresolution, courage, boldness, emulation, timidity and terror) that involved the control that we exercise over our actions. When we think of the outcome of hope or fear "as dependent on us we may have some difficulty in deciding upon the means or in putting them into effect."<sup>128</sup> Difficulty with the means "gives rise to irresolution, which makes us disposed to deliberate and take advice: the second [difficulty i.e. with enacting the means] is opposed by courage or boldness, of which emulation is one variety. And timidity is contrary to courage, as fear or terror is to boldness."<sup>129</sup>

Unlike most of the preceding passions, which concern future objects and involve an orientation towards the future, Descartes argued that "remorse does not concern the time to come, but rather the present or the past."<sup>130</sup> "Remorse of conscience," to give it its proper name, occurs "If we decide upon some course of action before the irresolution has ceased."<sup>131</sup> Remorse thus involves an element of self-reflection in time, since on Descartes' account it occurs only when we act before deliberating about a course of action. It presumably concerns 'the present or the past' because it can involve reflecting on either one's past or present precipitate actions.

The passions of joy and sadness, however, are oriented particularly towards the present: "Consideration of a present good arouses joy in us, and consideration of a present evil arouses sadness, when the good or evil is one that we regard as belonging to us."<sup>132</sup> They are essentially inwardly directed passions, orientated towards a present good or evil internal to us. Descartes identified another group of present-oriented passions (derision, envy and pity), however, that are directed towards external objects: "But when we think of the good or evil as belonging to other people, we may judge them worthy or unworthy of it. When we judge them worthy of it, that arouses in us solely the passion of joy, insofar as we get some benefit from seeing things happen as they ought."<sup>133</sup> The "joy aroused in the case of an evil" is "accompanied by laughter and derision."<sup>134</sup> On the other hand, "if we judge the others unworthy of the good or evil, in the former

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<sup>128</sup> *Ibid.*, 351.

<sup>129</sup> *Ibid.*, 351.

<sup>130</sup> *Ibid.*, 351.

<sup>131</sup> *Ibid.*, 351.

<sup>132</sup> *Ibid.*, 351.

<sup>133</sup> *Ibid.*, 351.

<sup>134</sup> *Ibid.*, 351.

case envy is aroused and in the latter case pity—envy and pity being species of sadness.”<sup>135</sup> However, Descartes added that “the same passions which relate to present goods and evils may often also be related to those which are yet to come, insofar as we think of a good or evil as if it were present when we judge that it will come about.”<sup>136</sup> Thus future objects can arouse ‘present-oriented’ passions if the mind considers them like present objects. Although the link between different passions and different times is strong, the way that we think about those times is capable of shifting, in a sense producing a new combination of time and passion. Descartes was also arguing here that thinking about the future with any kind of certainty may involve transforming it into a present object. In this case, at least, the delineation between ‘present’ and ‘future’ passions is permeable.

The final temporal passions considered by Descartes involve both present and past objects in time and the notion of those objects enduring in time. In the first group, he argued “We may also consider the cause of a good or evil, present as well as past.”<sup>137</sup> Thinking about causation in this case must involve considering temporally prior events. Descartes argued that “A good done by ourselves gives us an internal satisfaction, which is the sweetest of all passions, whereas an evil produces repentance, which is the most bitter.”<sup>138</sup> The first of the final grouping of passions (disgust, regret and cheerfulness) involves a passionate reaction produced by our perception of duration: “Sometimes the persistence of the good causes boredom or disgust, whereas that of the evil diminishes sadness.”<sup>139</sup> The other two passions in this group again involve an engagement with the past: “Finally, a past good gives rise to regret, which is a kind of sadness; and a past evil gives rise to cheerfulness, which is a kind of joy.”<sup>140</sup>

In typical style, Descartes made it clear that he believed that his classification of the passions, which was largely if not exclusively ordered according to time, was strikingly original: “I am well aware that here I part company with the opinion of all who have written previously about the passions.”<sup>141</sup> This claim to originality was based partly on his rejection of the distinction, which early modern authors inherited from Aquinas, between concupiscible and irascible passions, but presumably also on his

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<sup>135</sup> *Ibid.*, 351.

<sup>136</sup> *Ibid.*, 351.

<sup>137</sup> *Ibid.*, 351.

<sup>138</sup> *Ibid.*, 351–2.

<sup>139</sup> *Ibid.*, 352.

<sup>140</sup> *Ibid.*, 352.

<sup>141</sup> *Ibid.*, 352.

ordering of the passions according to time. Aquinas' distinction separated individual passions according to their object, or, more accurately, according to the relationship they have to that object. The concupiscent appetite relates to good or evil objects, whereas the irascible appetite relates to good or evil objects insofar as they are hard to obtain. The distinction between concupiscent and irascible passions thus centred on the subject's perception of an object as readily available or easy to flee; it was a classification of the passions organized around the concept of difficulty. According to Aquinas, there are eleven major passions in total, six in the concupiscent appetite and five in the irascible. The concupiscent passions are love (*amor*), desire (*desiderium*), joy (*gaudium*), hatred (*odium*), avoidance, or a motion away from a hated object (*fuga* or *abominatio*) and sorrow (*tristitia*). The irascible passions are hope (*spes*), despair (*desperatio*), audacity, or courage (*audacia*), fear (*timor*) and anger, or the impetus to resist present evil (*ira*). Descartes' rejection of the concupiscent-irascible distinction was based on the fact that he recognized

no distinction of parts within the soul, so I think their [i.e. previous writers] distinction amounts merely to saying that the soul has two powers, one of desire and the other of anger. But since the soul has in the same way the power of wonder, love, hope, and anxiety, and hence the power to receive in itself every other passion, or to perform the actions to which the passions impel it, I do not see why they have chosen to refer them all to desire or to anger.<sup>142</sup>

The connection between Descartes' concept of time and duration as ultimately derived from the soul itself and the model of time and the passions developed in the *Passions of the Soul* was not absolute. It is certainly clear, however, that both involved an understanding of the human subject orienting itself in and according to time. His account of time and the passions was initially presented as one in which the concept of time helps us to classify the passions, but it becomes clear that this classification also involved a broader notion of how we orient ourselves in time as passionate and temporal agents. Like some of the late Aristotelian authors who discussed the implications of a *sensus temporis* for human and animal action, Descartes' account of this temporal dimension of human nature was rooted in psychology or the science of the soul, but its ethical implications were not far from the surface. He made it clear that he approached the passions primarily as a natural philosopher (or *physicien*), but his account

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<sup>142</sup> *Ibid.*, 352.

of them also hints at the possibility that governing our passions might ultimately be an exercise in temporal self-government. Descartes' last work also showed, however, that the influence of late Aristotelian concepts on the way he thought about time was far from absolute. The *Passions of the Soul* presented a theory of the passions in which time must be "taken into account," and, ultimately, this phrase serves as an apt motto for much of the rest of Descartes' philosophy. Some of the fertile connections between time, duration and the soul present in Descartes' late Aristotelian contemporaries need to be taken into account in any understanding of how he conceived of the nature of time, and of the human subject.

## CHAPTER FOUR

### HOBBES

#### *Introduction*

Until recently, the concept of time in Thomas Hobbes' thought has received scant attention from scholars, and those who have considered it have on the whole paid little attention to the possible connections between time in his natural philosophy, psychology and political thought.<sup>1</sup> However, in this chapter I argue that the existence of such connections was a characteristic feature of Hobbes' treatment of time. Hobbes drew on themes approached from a very different perspective in late Aristotelian discussions of time and the soul, redirecting them towards his distinctive natural philosophical and political concerns. His natural philosophy of time developed into an argument about the temporal character of the political subject, which culminated in the first two books of *Leviathan* (1651). This vision of man as a temporal animal underpinned his theory of the state, but itself drew on recognisably Aristotelian concepts and distinctions. In formulating this theory, Hobbes drew on tendencies present in late Aristotelian metaphysics and natural philosophy, which I discussed in Chapters One and Two. He went much further than his Aristotelian contemporaries, however, in conceptualizing how man as a political subject might orient himself in time. In his essay on "Time, History and Eschatology in the Thought of Thomas Hobbes", John Pocock argued for the importance to Hobbes of a form of time composed of "statements about the occurrence, recurrence and continuity of the modes of human action and cognition held to constitute social and political behaviour, as well as the divine actions and utterances which... were indispensable to its understanding."<sup>2</sup> Pocock

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<sup>1</sup> See John Pocock, "Time, History and Eschatology in the Thought of Thomas Hobbes," in *Idem., Politics, Language and Time: Essays in Political Thought and History* (London: Methuen, 1972), 148–201; Yves-Charles Zarka, *La Décision Métaphysique de Hobbes: Conditions de la Politique* (Paris: Vrin, 1987), 63–65; Pierre-François Moreau, *Hobbes: Philosophie, Science, Religion* (Paris: Presses Universitaires de France, 1989), 57–67; José Medina, "Le Temps Chez Hobbes," *Les Etudes Philosophiques* (1997): 171–190 and Leijenhorst, *Mechanisation of Aristotelianism*, 128–137.

<sup>2</sup> Pocock, "Time, History and Eschatology", 151.

distinguished this notion of time as history and sacred history from what he called “the time of the physicist or the metaphysician.” Without denying the importance of sacred history and eschatology to Hobbes, this chapter argues that the time of the Aristotelian physicist and metaphysician played a central, and previously neglected, role in his thought.

Like Descartes, Hobbes grew up and wrote within a learned culture shaped by Aristotelian philosophy and the commentary tradition. He must have studied some Aristotelian natural philosophy and metaphysics at Oxford in the early years of the seventeenth century, and he had access to various late Aristotelian works through the library of his patrons, the Cavendish family, at Hardwick Hall.<sup>3</sup> However, again like Descartes, Hobbes also rejected and ridiculed Aristotelianism in print and in person, reserving particular hostility for Aristotle’s metaphysics and scholastic Aristotelian psychology.<sup>4</sup> Perhaps as a result, the influence of Aristotelianism on his philosophy became a topic of interest for scholars only relatively recently.<sup>5</sup>

Ignoring Hobbes’ public hostility outright is unwise, but so too is taking it at face value. We need to find a more sophisticated way to reconcile his distaste for Aristotelian metaphysics with his engagement with ideas derived from it.<sup>6</sup> My aim in this chapter is therefore not to turn Hobbes into a late Aristotelian author, but to show how he developed aspects of the Aristotelian language of time and the soul into an argument about man as the temporal subject of politics. This chapter begins by considering Hobbes’ treatment of time in *De Corpore* and his manuscript critique

<sup>3</sup> Relatively little is known about Hobbes’ time at Oxford: see Noel Malcolm, “A Summary Biography of Hobbes,” in *Idem, Aspects of Hobbes* (Oxford: Oxford University Press, 2002), 3–5. On Aristotelianism, anti-Aristotelianism and the Oxford curriculum, see Mordechai Feingold, “Mathematical Sciences and New Philosophies,” in *The History of the University of Oxford Volume IV: Seventeenth-Century Oxford*, ed. N. Tyacke (Oxford: Clarendon Press, 1997), 359–448; on the Hardwick library and Hobbes’ reading, see J.J. Hamilton, “Hobbes’ Study and the Hardwick Library,” *Journal of the History of Philosophy* 16 (1978): 445–53 and Arrigo Pacchi, “Una Biblioteca Ideale di Thomas Hobbes: Il MS E2 dell’Archivio di Chatsworth,” *Acme: Annali della facoltà di lettere e filosofia dell’università degli studi di Milano* 21 (1968): 5–42. For Hobbes’ views on the universities, see also R.W. Serjeantson, “Hobbes and the Universities,” in *The Philosopher in Early Modern Europe: The Nature of a Contested Identity*, ed. Conal Condren, Stephen Gaukroger and Ian Hunter (Cambridge: Cambridge University Press, 2006), 113–39.

<sup>4</sup> For example, Thomas Hobbes, *Leviathan*, ed. Richard Tuck (Cambridge: Cambridge University Press, 1996), 458–474.

<sup>5</sup> See e.g. Cees Leijenhorst, “Jesuit Doctrines of Spatiuum Imaginarium and Thomas Hobbes’ Doctrine of Space,” *Early Science and Medicine* 1:3 (1996): 355–380 and Leijenhorst, *Mechanisation of Aristotelianism*.

<sup>6</sup> See Edwards, “Aristotelianism, Descartes, and Hobbes.”

of Thomas White's *De Mundo Dialogi Tres*, then considers its relationship to his account of how the human subject exists and orients itself in time, before linking these closely connected discussions of time to his account of the political subject in *Leviathan*.

### *Time in Hobbes' Natural Philosophy*

#### *De Corpore*

The account of space and time in Chapter Seven of Hobbes' *De Corpore* (1655) began with privation, "that is, from feigning the world to be annihilated."<sup>7</sup> If a man were to imagine that the world no longer exists, Hobbes argued, "there would remain to that man ideas of the world, and of all such bodies as he had, before their annihilation, seen with his eyes, or perceived by any other sense; that is to say the memory and imagination of magnitudes, motions, sounds, colours &c as also of their order and parts."<sup>8</sup> These remaining images would be purely internal, mental productions, but "yet they will appear as if they were external, and not at all depending upon any power of the mind."<sup>9</sup> Hobbes believed that his annihilatory hypothesis illustrated the subjectivity of sensory *qualia*, demonstrating that "though all things be still remaining in the world, yet we compute nothing but our own phantasms." More fundamentally, it demonstrates that a radical division exists between things themselves, which can be intra- or extra-mental, and our mental representations of them.<sup>10</sup> Hobbes suggested that "things may be considered, that is, be brought into account, either as internal accidents of the mind, in which manner we consider them when the question is about some faculty of the mind; or as species of external things, not as really existing, but appearing only to exist, or to have a being without us."<sup>11</sup> Space and time, he argues, have to be considered in the second manner, as species, representations or phantasms that only appear to have an external existence.

Space, according to Hobbes, is purely imaginary. For if we have "a phantasm of any thing that was in the world before the supposed annihilation

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<sup>7</sup> Thomas Hobbes, *The English Works of Thomas Hobbes of Malmesbury*, ed. Sir William Molesworth (11 vols. London: John Bohn, 1839), vol. I, 91.

<sup>8</sup> *Ibid.*, 92.

<sup>9</sup> *Ibid.*, 92.

<sup>10</sup> *Ibid.*, 92.

<sup>11</sup> *Ibid.*, 92.

of the same; and consider, not that the thing was such or such, but only that it had a being without the mind, we have presently a conception of that we call *space*."<sup>12</sup> He defined space as "the phantasm of a thing existing without the mind simply."<sup>13</sup> Space is thus an internal representation of externality. Time is similarly representative and mind-dependent. Hobbes argued that "As a body leaves a phantasm of its magnitude in the mind, so also a moved body leaves a phantasm of its motion, namely, an idea of that body passing out of one space into another by continual succession."<sup>14</sup> Time is a 'phantasm of motion', or the mental image that remains even after a moving body has vanished. However, Hobbes expanded this definition by arguing that "this word *time* comprehends the notion of *former* and *latter*, or of succession in the motion of a body, in as much as it is first *here* and then *there*. Wherefore, a complete definition of time is such as this, TIME is the phantasm of before and after in motion . . ."<sup>15</sup> Just like space, for Hobbes time as a kind of phantasm or mental representation is capable of being 'divided' or 'compounded'—time can be distinguished into different parts, and 'times' put together in our mind. Both procedures occur "not by the operation of the hands but of the mind" and "in the mind"—that is, they are purely mental operations performed on our phantasms of motion.<sup>16</sup>

Hobbes insisted that his definition differed little "from the common opinion, or from Aristotle's definition."<sup>17</sup> The "common opinion", as he portrayed it, reflected the notion that, whilst "all men confess a year to be time," they "do not think a year to be the accident or affection of any body," and so therefore "they must needs confess it to be, not in the things without us, but only in the thought of the mind."<sup>18</sup> His position here closely resembled the account of time as a purely psychological construct rejected by most early modern Aristotelians. However, despite this obvious disparity, Hobbes emphasized the similarity between his account of time and that of Aristotle, arguing that it "agrees with this definition of Aristotle, *time is the number of motion according to former and latter*; for that numbering is an act of the mind; and therefore it is all one to say *time is the number of motion according to former and latter*; and *time is a*

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<sup>12</sup> *Ibid.*, 93.

<sup>13</sup> *Ibid.*, 94.

<sup>14</sup> *Ibid.*, 94.

<sup>15</sup> *Ibid.*, 95.

<sup>16</sup> *Ibid.*, 95, 96–7.

<sup>17</sup> *Ibid.*, 94.

<sup>18</sup> *Ibid.*, 94.

*phantasm of motion numbered.*<sup>19</sup> It is clear here that Hobbes presented an account of time that emphasized its mind-dependent nature; furthermore, a subjective element seems inherent in his treatment of time in *De Corpore*, since if time is a mental representation then it is also particular to the person in whom it is represented. To emphasize this point, Hobbes distinguished between the definition of time as an internal phantasm of motion, and the external motions by which we represent the passing of time, arguing that “if we would know by what movements time passes away, we make use of some motion or other, as of the sun, of a clock, of the sand in an hour-glass, or we mark some line upon which we imagine something to be moved, there being no other means by which we can take notice of any time at all.”<sup>20</sup> These motions are only secondary representations of our mental representation of motion, rather than fixed external measures of time. However, the conventional divisions of time into years, days and months are wholly mind-dependent or, as Hobbes puts it, “the names of such computations made in our mind,” rather than ‘the motions of the sun and moon.’<sup>21</sup> However, this account of time makes it unclear how a common notion of time—a concern for many late Aristotelian authors—is derived. This is a question that comes to play a greater role elsewhere in Hobbes’ theory of time.

Although Hobbes claimed that his theory of time was straightforwardly consonant with an Aristotelian account, I believe that the picture is more complex. Cees Leijenhorst has suggested that Hobbes’ argument that time is a phantasm of motion with no real existence in the world makes time in *De Corpore* an Aristotelian rational being or *ens rationis*.<sup>22</sup> He concludes that Hobbes’ view of time therefore has much in common with that of many late Aristotelian authors. In keeping with his broader thesis that Hobbes ‘mechanized’ Aristotelian metaphysics and natural philosophy, Leijenhorst stresses the ways in which Hobbes adapted elements of the late Aristotelian philosophy of time. He argues that Hobbes upheld a standard late-Aristotelian position on the reality and mind-dependence of time, but that he also reshaped this position to make time the representation or product of external motion.

Whilst I agree that Leijenhorst is right to emphasize the late Aristotelian context of Hobbes’ theory of time, I want to suggest that his interpretation

<sup>19</sup> *Ibid.*, 95.

<sup>20</sup> *Ibid.*, 95.

<sup>21</sup> *Ibid.*, 94.

<sup>22</sup> Leijenhorst, *Mechanisation of Aristotelianism*, 131.

is problematic in several respects. The most important problem concerns his argument that Hobbes' theory of time made it an Aristotelian rational being. Although Hobbes did not use the Latin term *ens rationis* or its English cognates in *De Corpore*, it is nevertheless reasonable to assume that contemporary Aristotelian readers would have interpreted his conception of time as wholly mind-dependent as an argument that time is a rational being. However, Leijenhorst confuses the issue by suggesting that Hobbes' position resembled that of Suárez and the Coimbra commentator. In fact, his argument most closely resembled the 'ancient' position attributed to Augustine and Galen by authors such as Zanardi and the Coimbra commentator, but rejected by all late sixteenth- and early seventeenth-century Aristotelians. As we have seen, neither Suárez nor the Coimbra *Physics* commentary argued that time is wholly mind-dependent: instead, they believed that one aspect of it is mental.<sup>23</sup> For Hobbes' predecessors and contemporaries, this was an important distinction. So whilst Leijenhorst is correct to argue that Hobbes took a recognisable position in the late Aristotelian debate, he does not emphasize the extreme nature of this position, and thus the extent to which it separated him from many of his contemporaries. Even more eclectic textbook authors such as Keckermann and Timpler did not depart from the contemporary consensus on the nature of time in the same way as Hobbes. Moreover, Leijenhorst's choice of authors against which to read Hobbes—the Coimbra *Physics* commentary, Suárez, Rubius and Toletus, and the Dutch natural philosopher Franco Burgersdijk—essentially represents the Jesuit, Thomist approach to the problem of time and the soul. I believe that the ideas found in late Aristotelian discussions of internal and external time, such as the divide between general and specific, internal experiences of time, and the role of the imagination in time-perception, were also echoed in Hobbes' work.

These echoes, and the full implications of Hobbes' theory of time, are most apparent when his account of time in *De Corpore* is read in the context of the earlier drafts of his natural philosophy from the 1640s, and of his 1642–3 critique of Thomas White's *De Mundo Dialogi Tres*, which contained an important digression on the nature of time. Those scholars who have considered Hobbes' theory of time in any detail have either ignored these drafts and the surviving notes taken from them by Charles Cavendish and others, or elided the position outlined in the critique of White's

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<sup>23</sup> This is a point that Leijenhorst concedes in a roundabout way; *Ibid.*, 134.

*De Mundo* with that of *De Corpore* itself. I believe that this approach misses the full picture, because Hobbes' approach to the question of time, and specifically to the relationship between time and the mind, was nuanced in slightly different ways in the *De Mundo Examined* and in *De Corpore*—nuances that were significant for other areas of Hobbes' philosophy. These differences chiefly concerned the emphasis placed on the role of the powers of the will and the imagination in time-perception: although both of these elements are present throughout Hobbes' discussions of time, they were not always presented identically. Consequently, although both texts share a framework of common assumptions, Hobbes in the *De Mundo Examined* appears to have given more consideration to the role of the imagination in the perception of time.

The development of *De Corpore* during the 1630s and 40s has long puzzled scholars. A range of incomplete draft versions survive, most of which are notes taken by friends and correspondents of Hobbes from several no longer extant autograph manuscripts. Even establishing the chronology of these manuscripts has proved contentious, and their dating is still not certain. However, work by Noel Malcolm has done much to clarify the situation, and my reading of the *De Corpore* draft material draws on his suggested chronology.<sup>24</sup> Material about time appears in four extant manuscripts before the first Latin edition of *De Corpore* in 1655: in Hobbes' critique of White's *De Mundo*, dated between 1642 and 1643, in the notes supposedly taken by Lord Herbert of Cherbury (National Library of Wales manuscript 5297), which Malcolm dates to after July 1643, in notes taken by Hobbes' employer Charles Cavendish in 1645 (Harleian MS 6083), and in Latin notes in Robert Payne's hand (Chatsworth MS A10), which Malcolm argues were taken from the same text as those of Cavendish, and which he dates to after July 1646.<sup>25</sup> Of these manuscripts, the critique of White contains the most complex and interesting discussion of time, which in some respects relates less directly than the other drafts to the section on time in Chapter Seven of *De Corpore*.

<sup>24</sup> Noel Malcolm, "Robert Payne, the Hobbes Manuscripts, and the 'Short Tract,'" in Malcolm, *Aspects of Hobbes*, 99–103.

<sup>25</sup> These drafts are reproduced in Thomas Hobbes, *Critique du De mundo de Thomas White*, ed. Jean Jacquot and Harold Whitmore Jones (Paris: Vrin, 1973), 449–513.

### *The De Mundo Examined*

Hobbes' critique of White is an enigmatic text. Commonly known as the *De Mundo Examined*, or the *Anti-White*, it was composed between 1642 and 1643, during Hobbes' exile in Paris. There is some evidence that Hobbes himself referred to this manuscript as the *De Loco, Motu et Tempore*.<sup>26</sup> This title does not reflect the entire content of the work, but it may indicate the importance that Hobbes assigned to these particular topics within the manuscript. There was a tradition in Aristotelian natural philosophy textbooks of assigning priority to questions of motion, place and time, which Hobbes may have followed; it is also true that, in the case of time, at least, the title reflects some of the more original aspects of his work. The critique, preserved in the Bibliothèque Nationale in Paris as MS fonds latin 6566A, remained unpublished in Hobbes's lifetime, and was re-discovered only in the 1950s. A transcription of the original Latin, edited by Jean Jacquot and Howard Jones, was published in 1973, and Jones published an English translation in 1976.<sup>27</sup> Thomas White (also known as Blacklo) was an English Catholic priest, philosopher, and theologian who taught in a number of Catholic colleges on the Continent, and played an important role in Catholic politics in England.<sup>28</sup> He published a number of philosophical works, including the *Peripatetical Institutions* (1646), *Euclides Physicus* (1657), and *Euclides Metaphysicus* (1658). However, the *De Mundo Dialogi Tres*, published in Paris in 1642, was the first major work issued under his own name. As its name suggests, it is a series of three dialogues, which take place during a journey to Reims and feature three main characters, Ereunius, Andabata and Asphalius. The dialogues are entitled "Of the matter of the world," (*Dialogi primi de materia mundi*), "Of the form

<sup>26</sup> Karl Schuhmann, "Hobbes dans Les Publications de Mersenne en 1644," *Archives de Philosophie (Bulletin Hobbes VII)* 58 (1995): 4–5 and Frithiof Brandt, *Thomas Hobbes' Mechanical Conception of Nature* (Copenhagen: Levin & Munksgaard, 1928), 168.

<sup>27</sup> Thomas Hobbes, *Thomas White's De mundo Examined*, transl. Harold Whitmore Jones (Bradford: Bradford University Press, 1976). On the history of the text, see Jean Jacquot, "Notes on an Unpublished Work of Thomas Hobbes," *Notes and Records of the Royal Society of London* 9 (1952): 188–195 and Hobbes, *Critique du De mundo*, 12–13, 89–97. I have made my own emended translations from Hobbes' Latin text, because I have reservations about Jones' English version, and particularly about his translation of psychological terms (*phantasma*, *imaginatio*, *imago* and *sensio*). For a statement of Jones' translation methodology see Hobbes, *De mundo Examined*, 17–18.

<sup>28</sup> For White's biography, see Beverly Southgate, "Covetous of Truth": *The Life and Work of Thomas White, 1593–1676* (Dordrecht: Kluwer, 1993), 12–33 and Daniel Garber and Michael Ayers, *The Cambridge History of Seventeenth-Century Philosophy*, 2 vols. (Cambridge: Cambridge University Press, 1998), 147.

of the world, or of the motion of great bodies," (*Dialogi secundi, de forma Mundi, seu de motu magnorum corporum*) and "Of the cause of the world, or the principle of its government and end" (*Dialogi tres, de causis Mundi, seu de principio gubernatione & interitu ipsius*). Whilst the argument of the *De Mundo* is complex and detailed, White's overall project has been described as an attempt to reconcile Aristotelian physics with Copernican cosmology and religion.<sup>29</sup> The whole text is loosely based on Galileo's *Dialogo Sopra i Due Massimi Sistemi del Mondo* (1632), and each dialogue is subdivided into individual points, which White called *nodi*.<sup>30</sup> There are fifty *nodi*, of which Hobbes' manuscript discusses forty. The material on time is found in Hobbes' discussion of *nodus* three of the third dialogue.

Hobbes' treatment of time here was initially motivated by his examination of the main thesis of *nodus* three, "That motion has not existed from all time."<sup>31</sup> White's discussion of this point was complex, and centred on the notion that eternal motion is impossible because time cannot be infinite. *Nodus* three begins with Ereunius's assertion that infinite time is impossible, because any delimited part of it would also have to be infinite: "From the point at which we are, some hour is necessarily distant by infinite degrees; if it is similar to our hours, it must have been limited as far as [its] existence and individuality, and must be situated between two equally limited hours, one before and the other after."<sup>32</sup> But, he suggests, if this infinitely distant hour is limited, then its limits must enclose an infinite amount of time: "Thus between this one and that which (whilst we talk) now passes by jealously, how should it not be that the infinity that they want is enclosed?"<sup>33</sup> Ereunius cannot believe that this is possible: as

<sup>29</sup> Beverly Southgate, "Torn Between Two Obligations: The Compromise of Thomas White," in *The Rise of Modern Philosophy: The Tension Between the New and Traditional Philosophies from Machiavelli to Leibniz*, ed. Tom Sorrell (Oxford: Clarendon Press, 1995), 121. See also Noel Malcolm, *Thomas Hobbes and Voluntarist Theology* (University of Cambridge PhD Thesis, 1983), 47.

<sup>30</sup> White claimed in his dedication that "Longa dialogorum Galilaei de systemate conscriptorum meditatione conceptum erat hoc opus..."

<sup>31</sup> The Latin title given to this section by White was "Quod motum non ab aeterno extitisse." In Hobbes' MS this was changed to "Mundum non ab aeterno extitisse."

<sup>32</sup> Thomas White, *De mundo dialogi tres* (Paris: Apud Dionysium Moreaum, via Iacobaea, sub Salamandra, 1642), 285–6: "A signo enim in quo sumus aliquam horam infinitis mediis absistere necessum est, eam, si nostris similis est, determinatam esse quoad existentiam & individualitatem, & inter duas aequae determinatas, unam priorem, posteriorem alteram esse collocatam."

<sup>33</sup> *Ibid.*, 286: "Inter hanc proinde & eam quae nunc (dum loquimur) praeterit invida, quomodo non sit inclusum quod volunt infinitum?"

he puts it, "I grow utterly dim."<sup>34</sup> His broader point is that, if there were an infinite number of hours (or an infinite succession), "between any two points, an infinite multitude of successions will be contained."<sup>35</sup> White repeated this argument in more detail in his *Peripateticall Institutions* of 1656, arguing there

That Motion cannot be *infinite*, the same argument convinces which made it plain before, that all Permanent Quantity is finite. For, suppose backwards from this instant or *now* wherein we are, an infinite Time already past, there must be infinite hours past; some one, therefore, will be infinite others distant from us [sic]; and, in that one, a determinate *now*, which, with this present instant, must enclose an infinite on both sides.

... Nor, if the computation be made forwards, will the reason differ: for, there must still be infinite hours to come; and one of them will be infinite others distant from us; and, in that one, a certain *now* terminating an infinite, which is impossible, whereas yet, what is *future* is, in that very respect, possible.<sup>36</sup>

In both works, White seems to have argued both that all parts of any infinite series must themselves be infinite, and that any limited part of that infinite series may be seen as infinitely distant from another. Neither of these points seem self evident to modern readers. They also sit uneasily with assumptions made in late Aristotelian natural philosophy about infinite time.<sup>37</sup> In *Physics* III.4, Aristotle had distinguished between two kinds of infinity: infinity by addition, and infinity by division.<sup>38</sup> Perceivable bodies cannot be infinite because they are limited, and because the place they occupy is finite.<sup>39</sup> In fact, no actual magnitude is infinite, but it can be infinitely divisible; therefore infinity is possible *in potential*, by division. Aristotle was clear, however, that time can be infinite because it is potential: that is to say, the parts of time succeed each other, and the previous parts cease to exist. Time is a process because it is always coming

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<sup>34</sup> *Ibid.*, 286: "Ego prorsum hebesco."

<sup>35</sup> *Ibid.*, 289: "Si enim successio est infinita, inter duas aliquas, infinita continebitur succedentium multitudo."

<sup>36</sup> Thomas White, *Peripateticall Institutions in the Way of that Eminent Person and Excellent Philosopher Kenelm Digby* (London: John Williams at the Sign of the Crown in S. Paul's Church-Yard, 1656), 188.

<sup>37</sup> On late Aristotelian discussions of infinity, see Ian Maclean, "Aristotle's Infinites in the Late Renaissance," in *Au-delà de la "Poétique": Aristote et la Littérature de la Renaissance*, ed. Ullrich Langer (Geneva: Droz, 2002), 123–137.

<sup>38</sup> Aristotle, *Physics*, 65.

<sup>39</sup> *Ibid.*, 71.

to be; it is thus a potential infinite.<sup>40</sup> White, however, seemed to reject the Aristotelian argument about the potential infinity of time: his idea of an hour 'necessarily distant by infinite degrees' suggests that he thought of infinite time as the adding of terms in a sequence, and he denied that divisibility is possible.<sup>41</sup>

Hobbes was, perhaps understandably, unimpressed by White's arguments. He suggested both that White had misunderstood the terms of the debate, and that his errors had potentially grave consequences. To White's argument about infinity, which he summarized as "If time can be infinite, then any delimited part of it is infinite," Hobbes replied "What could be more apparent than the falsity of this inference?"<sup>42</sup> He insisted that White's argument was not only misguided, but that it was also directed at the wrong aspect of the problem. One cannot prove that motion is not eternal by discussing the nature of time.<sup>43</sup> Hobbes therefore rejected both this *non sequitur* and its theological implications. By denying that time is infinite, he suggested, White risked denying eternity to God. This, incidentally, was a charge levelled against Aristotle himself in the Peripatetic tradition: "See how, almost necessarily, those who subject inconceivable Divine matters to their own metaphysical speculations clash at every step with the Christian faith!"<sup>44</sup>

Although he found White's position misguided and potentially dangerous, and went on to criticize it further, it allowed Hobbes to advance his own views on time. He suggested that, to fully understand and refute White's argument, it is first necessary to define time itself.<sup>45</sup> This concern to develop his own position alongside his critique of White was an important characteristic of the manuscript as a whole, and may reflect the text's status as an initial presentation of Hobbes' philosophy to the circle

<sup>40</sup> *Ibid.*, 72.

<sup>41</sup> White, *De mundo*, 285–6.

<sup>42</sup> Hobbes, *Critique du De mundo*, 333: "Consequentiae huius magis conspicua verbis paucioribus, vis erit hoc modo: *Si tempus potest esse infinitum, tum aliqua determinata pars eius est infinita*, cuius consequentiae falsitate quid potest, esse detectius?"

<sup>43</sup> *Ibid.*, 333: "Regula demonstrationum legitimarum universalis est ut theorematum probandum inferatur ex definitione vel proprietate aliqua subiecti. Cum ergo motum non esse aeternum non ex definitione probet, neque ex aliqua proprietate motus, sed ex eo quod tempus non est infinitum, neque ipsum tempus finitum esse probat ex eo quod natura eius consistat in motu, non motui solummodo, sed omni in universum actui, existentiaeque, etiam ipsi Deo aeternitatem negat."

<sup>44</sup> *Ibid.*, 333. "Vide quam pene necessario omni passu impingunt in fidem Christianam qui res divinas inconceptibilisque speculationibus suis subjiciunt metaphysicis."

<sup>45</sup> *Ibid.*, 331.

of philosophers centred on his friend Marin Mersenne. Again, the importance that Hobbes assigned to time within the manuscript as a whole may be inferred from its title: taken at face value, this text can be seen as an (incompletely developed) presentation of his philosophy concerning place, motion and time.

The theory of time that Hobbes advanced here resembled the account in Chapter Seven of *De Corpore* in many respects. His definition of time began in a similar way, with memory, imagination and the annihilatory hypothesis. He argued that imagination consists of “the images of those bodies that once existed before our eyes as objects but now no longer exist.”<sup>46</sup> These images, like the real bodies from which they are derived, possess attributes such as “shape, colour, motion and rest.” These attributes, however, are also imaginary, for

if they represent bodies in motion, or bodies traversing any space one after another, these same images are imaginary motions, or images of motion, or the images of a succession from former to latter, although a body itself we actually see to be moved no longer moves.<sup>47</sup>

This “image of motion (*imago motus*), or imaginary motion (*motus imaginarius*), or imaginary succession (*successio imaginaria*), or the image of succession (*imago successionis*) (all of these mean the same thing) is that which we call time.”<sup>48</sup> Time according to this formula is therefore an image of motion and a succession that exists only in the mind. However, there was a certain ambiguity here: Hobbes argued that “an imaginary succession” (*successio imaginaria*) and “the image of succession” (*imago successionis*) are identical, although there is clearly a difference between a sequence of mental images and a mental image of sequence. The first could well be a solely internal image and process, with no external referent, but the second seems to involve a kind of intentionality, because it represents a succession outside the mind. The same contrast is evident in this passage between *imago motus* and *motus imaginarius*. For although Hobbes

<sup>46</sup> *Ibid.*, 331: “Inprimis vero neminem esse puto qui nesciat observari aliquando animo nostro imagines corporum eorum quae olim existentia & oculis obiecta, nunc tamen non existunt amplius (in hoc enim consistit imaginatio, sive memoria rerum praeteritarum).”

<sup>47</sup> *Ibid.*, 331: “... denique quatenus repraesentant corpora mota, sive successive per spatium aliquod transeuntia, eadem imagines sunt motus imaginarii, sive imagines motus, vel imagines successionis a priori in posterius, licetque corpus ipsum quod realiter moveri vidimus non amplius moveatur.”

<sup>48</sup> *Ibid.*, 332: “Iam *imago motus*, sive *motus imaginarius*, sive *successio imaginaria*, sive *imago successionis* (eadem enim est omnium significatio) est illud quod omnes appellamus *tempus* ...”

claimed here that a mental image of motion and ‘imagined’ or imaginary motion are identical, it is clear that the two phrases have slightly different meanings. Whilst a mental image of motion is an internal representation of external change, the notion of ‘imagined’ or ‘imaginary’ motion can also imply a purely internal concept with no external referent.

This ambiguity in Hobbes’ treatment of imagination and images is more significant to his argument about time than he admitted outwardly, because his critique of White’s position on infinity also mobilized the idea that we can *imagine* time in a creative, or fictive process. The notion that time is subject to the operations of the mind in this way was not unique to the *De Mondo Examined*, since the notion that we can perform the mental operations of composition and division upon time was discussed in Chapter Seven of *De Corpore*, but it received more extensive discussion in the critique of White. If time is imagined or imaginary motion, he argued, then infinite time or eternity is a time beyond that which we can imagine. Hobbes here drew a parallel with the Aristotelian concept of imaginary space, arguing that “just as a body whose magnitude we cannot match by any joining together of imaginary spaces is called infinite in magnitude, thus a motion whose limit we cannot comprehend by joining together imaginary successions is called infinite time, that is, eternity.”<sup>49</sup> This process can be seen as a version of the operation of ‘collecting’ the parts of time “into one sum in the mind” that Hobbes called ‘Composition’ in *De Corpore*.<sup>50</sup> Against White’s argument that infinite time is impossible, Hobbes countered that time is imaginary, and that infinite time is beyond that which we can imagine. Infinity is thus not unthinkable, but rather unimaginable.<sup>51</sup> Parallels existed here with the concepts of imaginary space and time discussed by late Aristotelian authors such as Suárez and Petrus Fonseca, but Hobbes also introduced the notion that time is a kind of imagined mental creation. Joining together ‘imaginary successions’ involves more than the

<sup>49</sup> *Ibid.*, 332: “... et sicut corpus dicitur magnitudine infinitum, cuius magnitudinem nulla nostra additione spatiorum imaginariorum possumus adaequare, sic motus, cuius terminum nulla additione successionis imaginariae assequi possumus, tempore infinitum, id est aeternum esse dicimus. Similiter quies aeterna dicitur, cuius terminus nulla motus imaginatione potest exaequari.”

<sup>50</sup> Hobbes, *English Works*, I, 97.

<sup>51</sup> See Hobbes, *Leviathan*, 23: “Whatsoever we imagine, is Finite. Therefore there is no Idea, or conception of any thing we call Infinite. No man can have in his mind an Image of infinite magnitude; nor conceive infinite swiftness, infinite time, or infinite force, or infinite power.”

mind simply representing external objects in motion: instead, it can also imply a kind of creative or fictive power.

However, as in *De Corpore*, Hobbes denied that time equates to real motion. As time is only an image of motion, or mental sequence, it cannot involve real motion, for “if the nature of time consists of being some real succession, there would be no time at all. For a real past succession no longer exists, because it has passed; and a future one does not yet exist, because it is a future one. The present also does not exist unless it is an instant, in which succession is impossible.”<sup>52</sup> This is the argument about the unreality of the parts of time found in Pererius and other late Aristotelian authors. However, Hobbes accented it in a different way. He argued that “time is not a motion in things themselves outside the mind, but is mere imagination.”<sup>53</sup> It involves motion within the mind, because a succession of images of motion occurs in someone who perceives time: in ‘someone imagining’, these images “are real, for ‘imagination of motion’ is the same as ‘motion in him who imagines’... for the imagination is the real motion of the organ with which we imagine.”<sup>54</sup> Again, Hobbes made a slide between a mental representation of motion and purely mental motion, since although the former might involve the latter, it is not necessarily identical with it. He also suggested that time “has the same relation to real motion as has the reflection in a mirror to the true face and a mirrored shape to a real shape,” suggesting that here he was thinking primarily of a process of representation.<sup>55</sup>

Hobbes insisted again that this “definition in no way differs from that of Aristotle, who defines time as ‘the number of motion according to former and latter’.”<sup>56</sup> However, as in *De Corpore*, although many of his assumptions would have been recognisable to his Aristotelian predecessors and contemporaries, in the discussion of time in the *De Mundo Examined* his approach was not straightforwardly Aristotelian. Moreover, as I have outlined, there are also differences in emphasis between the theory of

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<sup>52</sup> Hobbes, *Critique du De mundo*, 332: “si temporis natura in eo consistat ut sit realis aliqua successio, nullum esset omnino tempus, nam successio praeterita realis non amplius existit quia praeteriit; futura nondum existit, quia futura. Praesens autem non est nisi instans, in quo successionem esse est impossibile.”

<sup>53</sup> *Ibid.*, 332: “restat igitur ut tempus non sit motus in rebus ipsis extra animam, sed mera imaginatio.”

<sup>54</sup> *Ibid.*, 332: “Neque obstrepat quis hoc loco dicens meram imaginationem nihil esse, nam motus imaginarii quatenus sunt imaginarii, non habent existentiam illam quam videntur habere, sunt tamen motus reale in imaginante.”

<sup>55</sup> *Ibid.*, 332.

<sup>56</sup> *Ibid.*, 332.

time he mobilized against White and the version advanced in his published work. These differences chiefly concern the use made by Hobbes of the vocabulary of 'imagination', and his discussion of the mind's ability to shape or creatively imagine time. Although both texts emphasize that the mind is capable of both producing internal representations, or phantasms, of motion, and of connecting and compounding those representations, in my view the *De Mundo Examined* places more emphasis on the creative possibilities raised by the mind's ability to compound, divide, and *imagine* time.

The issue of vocabulary is complex. The critique of White always refers to time as an *image* (*imago*), rather than as a phantasm (*phantasma*), which is the term commonly used in *De Corpore*. Time in the *De Mundo Examined* was therefore connected more explicitly to an extensive vocabulary of *imagination*, involving a number of substantives connected to the verb *imaginere*. Thus time in the *De Mundo Examined* is an *imago mentalis*, or *motus imaginarius*. The differences in terminology between the two works involved something more complex than simply the choice of another word to denote mental representations of external objects, because Hobbes used the term *phantasma* and its cognates in this sense elsewhere in the critique of White.<sup>57</sup> I believe that it signals Hobbes' engagement with the late Aristotelian concept of imaginary time, and particularly with the related argument that time may be *imagined*. Hobbes argued in the *De Mundo Examined* that a mental image of time is also a mental representation of motion, and, in keeping with his later psychology, that *imaginatio* is merely a sense impression retained in the mind, but in this text (and in *De Corpore*) he also developed the argument that imagination may operate as a creative mental faculty.

This aspect of imagination was most apparent in the *De Mundo Examined* when he suggested that, although time is an image of external motion, "Nothing therefore prevents us from proceeding by imagining as far as it pleases us, and thus it is that the image of motion, or imaginary motion, is determined not by the motion of bodies themselves, but by our will."<sup>58</sup> In a sense, this was the ultimate consequence of Hobbes' argument that

<sup>57</sup> For example, *Ibid.*, 326–7: "Hi motus repulsi sive retro procreati per reactionem & resistantiam cordis usque ad partes animalis extimas, sunt phantasmata illa externe apparentia quae vocamus, in visione quidem lucem, vel colorem, in auditu sonum, in tactione sensum calidi, frigidi, asperi, laevis, &c., in olfactione odorem, in gustatione saporem."

<sup>58</sup> *Ibid.*, 331–2: "Nihil tamen impedit quin nos possimus procedere imaginando quoque libuerit, atque ita fieri ut imago motus, sive motus imaginarius determinetur non motu corporum ipsorum, sed arbitrio nostro."

time is a wholly mental phenomenon: for, if it is not limited by external motion, only the mind itself can define and determine what time is. It also exploits the double meaning of *ens rationis* in late scholastic metaphysics: a wholly mental being could be both a mental concept and a fictional creation.

In this sense, Hobbes suggests that time is what Petrus Fonseca and other late Aristotelians called *ens fictum*: an imagined, fictional being. However, this was a conclusion that even the most eclectic Aristotelian authors avoided. Hobbes' reference to the mind 'imagining' and being limited only by the will implied a concept of imagination that is not restricted by external referents, and in which the mind imagines motions in the sense of creating and inventing them. Hobbes emphasized the potential of this form of imagined time, arguing that because we can imagine any motion we choose, "time has always been whatever anyone wills."<sup>59</sup> Hobbes argued that, "Therefore, just as the astronomers discovered a place beyond the visible world in which they placed the spheres they had devised, so any poet can fix on a sequence [*successio*] in accordance with which he can shape whatever narrative he has himself devised before the beginning of the history that we now have."<sup>60</sup> Here, he contrasted a conventional and, to most late Aristotelian authors, largely uncontentious view of imaginary space as the place that exists beyond the visible world with the more unexpected concept of imaginary time as a potentially fictitious creation. Hobbes's reference to a poet might suggest that he meant to restrict the ability to 'will' time to the creation of fictions in literature. However, he did not explicitly distinguish between the poet's choice of whatever sequence he desires, and the more prosaic ability to let "our imagination rove as far as we choose" with respect to time.

The notion that time might be 'imaginary' in the sense of being created and shaped by the mind, as well as being the representation or image "of those bodies that once existed before our eyes but now no longer do so... [which]... constitutes imagination, or memory of things past" is presented more strongly than in Chapter Seven of *De Corpore*.<sup>61</sup> However, as Hobbes' discussion of the mind's ability to 'compound' or 'divide' time in

<sup>59</sup> *Ibid.*, 333: "Fuerit autem *tempus* quicquid quis voluerit."

<sup>60</sup> *Ibid.*, 331–2: "ita ut quemadmodum astronomi invenerunt locum extra mundum visibilem, in quo ponerent sphaeras quas excogitaverant, ita poeta quilibet possit invenire successionem, qua cum accommodare possit quamcumque ipse fixerit narrationem ante initium historiae quam nunc habemus."

<sup>61</sup> *Ibid.*, 331.

Chapter Seven demonstrates, it is clear that the language of 'phantasm' or *phantasma* he typically used in *De Corpore* never excluded the possibility that the mind takes an active role in constructing a conception of time. Whilst in his published natural philosophy Hobbes preserved the notion of the mind constructing or shaping a concept of time, this strand of Hobbes' argument received more attention in the critique of White. I believe that this approach was shaped partly by Hobbes' response to White's view of infinity. To an extent, it presented a creative response to his denial of infinite time. To counter White's argument that time has certain limits, Hobbes suggested that it is limited only by our imagination.

Hobbes' use of the language of imaginary time should also be read in the context of White's hostility to the term. In the *De Mundo*, White had Andabata 'grow nauseous' at the very thought of imaginary time, an idea that Hobbes picked up on in his critique.<sup>62</sup> He also criticized the concept again in his *Peripateticall Institutions*, noting that one could argue that "Before the creation of the World, there was no time; however we may imagine Time, before the World, as we do Place out of the World: but these Opinions are ill grounded in the Fancy."<sup>63</sup> White's language here recalled Hobbes' argument in his earlier critique, and punned on the role of 'fancy' (or imaginative power) in his theory of time. This passage suggests that the disagreement about time between Hobbes and White was sustained beyond 1642–3, a point that is reinforced by Hobbes' critique elsewhere in *De Corpore* of White's argument that time is identified with heavenly motion. The question of time may well have been a continued point of disagreement between the two men.<sup>64</sup>

The notion that, as he put it in the *De Mundo Examined*, time might be 'whatever one's wishes' was in some respects the natural conclusion

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<sup>62</sup> White, *De Mundo*, 286: "Mihi vero stomachus nescio quomodo seu voluntatur seu nauseat, dum euomeda [sic] est tot annis radicata de tempore imaginario sententia; sed dum quaero quid cum ratione possim opponere, subito residet ille tumor & in placorem reddit."

<sup>63</sup> White, *Peripateticall Institutions*, 59.

<sup>64</sup> Anthony a Wood reported that Hobbes and White continued to debate philosophical issues into old age: Anthony a Wood, *Athenae Oxonienses* (4 vols. Hildesheim: Georg Olms Verlagsbuchhandlung, 1969), vol. III, 1247–8: "Hobbes of Malmesbury had a great Respect for him [White], and when he lived in Westminster, he would often visit him, and he Hobbes, but seldom parted in cool Blood: for they would wrangle, squabble, and scold about philosophical Matters like young Sophisters, though either of them was eighty Years of Age; yet Hobbes being obstinate, and not able to endure Contradiction (tho well he might, seeing White, was his Senior), yet those Scholars, who were sometimes present at their wrangling Disputes, held that the Laurel was carried away by White . . ."

to draw from Hobbes' identification of time elsewhere in that work with mental motion. For, if time does not relate to a determined external motion such as that of the sun, then it will inevitably be identified with the individual mind or soul. The Aristotelian problem of the unity of time, with which all contemporary authors grappled in their accounts of time and the soul, was for Hobbes not a problem but in a sense the solution. In this respect, he followed eclectic Aristotelian authors such as Keckermann and Timpler in arguing that a time can be particular to the individual. However, whilst Keckermann and Timpler's concept of internal or intrinsic time depended on the continuing existence of an individual being, Hobbes related time to that individual's mental life and creative power. In doing so, he advanced a notion of the *self* in time that was never quite articulated in late Aristotelian accounts of internal and external time. In his critique of White, the notion that the mind can imagine or create a time that is particular to us became a positive feature of Hobbes' theory.

Reading Hobbes' response to White therefore reveals a strand to his theory of time that, whilst still present, is in some respects less obvious in *De Corpore*. There is some indication that Hobbes himself thought about his theory of time in these terms. He argued that "I think that the definition of time, that is 'time is the mental image of motion', can be composed from many things."<sup>65</sup> Hobbes did not specify these different elements, but this remark accords with the idea that he consistently thought of time in terms both of representation and of the creative power of the imagination, but that he emphasized the former aspect in his published work. Hobbes suggested in his critique of White that although time may derive from external motions, it is in no sense limited by them. In scholastic Aristotelian terminology, he advanced a model of time as *ens factum*, rather than *ens rationis*. In Hobbes' manuscript writing on the subject, time was at times more of a chimera than a concept. However, in both manuscript and published accounts of time the notion of subjectivity was paramount. Time is subjective for Hobbes in both instances because it involves the individual's mental representations of motion, and on the mind creating and imagining time. I argue that this element of subjectivity had important implications for Hobbes' political theory, and particularly for his theory of man as a political subject.

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<sup>65</sup> Hobbes, *Critique du De mundo*, 332: "Definitionem illam temporis, nempe *tempus est motus imago mentalis*, ex multis colligi posse puto."

### *The De Corpore Drafts*

The surviving notes on drafts of *De Corpore* from the 1640s and in the first Latin edition of 1655 provide further evidence of shifts in emphasis within Hobbes' views on time. Essentially, the discussions of time in these drafts resembled the Chapter Seven of *De Corpore* more closely than the *De Mundo Examined*. In particular, they consistently referred to time as a 'phantasm' or *phantasma*, rather than an image of motion. The notes in English and Latin ascribed to Herbert of Cherbury, which Noel Malcolm dates to after July 1643 (that is, very soon after the critique of White was composed), read "Tempus is an idea of motion quatenus we do imagine in motion, a *prius* et *posteriorius* or *succession*."<sup>66</sup> Similarly, the notes by both Robert Payne (post-July 1646) and Charles Cavendish (1645) on the same draft of *De Corpore* refer to the notion of 'imagining' a succession in motion. Payne's Latin notes read "Tempus est *phantasma* motus, quatenus in motu *imaginamur* *prius* et *posteriorius*, sive *successionem*. Vel tempus est *phantasma* motus *numerati*".<sup>67</sup>

These notes are sparse, but they give important information about the ways in which Hobbes explored the connection between time and the imagination before the publication of *De Corpore*. For, whilst the claims about the role of the imagination in time-perception that Hobbes directed against White are absent from these notes, they nevertheless preserve the notion of 'imagining' succession in time found in the *De Mundo Examined*. The concept of imagination here clearly seems to be used less in the sense of a creative, fictional process, and more to indicate mental representation. Indeed, the first Latin edition of *De Corpore* (1655) also preserved the distinction, arguing that "Tota ergo definitio temporis talis est: *Tempus est phantasma motus, quatenus in motu imaginamur prius et posteriorius sive successionem*; quae convenit cum definitione Aristotelica *Tempus est numerus motus secundum prius et posteriorius*." This passage matches the version in Payne's notes exactly.<sup>68</sup> Only in the 1656 English translation (which, Karl Schuhmann argues, Hobbes may have made himself) is this notion of 'imagination' absent, although much of its work is done by Hobbes' notion of time as a 'phantasm' of motion and the discussion of the mind's ability to compound and divide time. Considering only the English edition, or missing the variations in the language Hobbes used

<sup>66</sup> *Ibid.*, 450.

<sup>67</sup> *Ibid.*, 474.

<sup>68</sup> Thomas Hobbes, *De Corpore*, ed. Karl Schuhmann (Paris: Vrin, 1999), 77.

to discuss time, as many scholars have, therefore obscures an element of continuity between the theory of time that he first advanced in 1642–3 and his published natural philosophy.

### *Hobbes' Psychology of Time*

Hobbes' theory of time therefore emerges as more complex, and more indebted to the late Aristotelian tradition, than scholars have previously recognized. But the annihilatory hypothesis that Hobbes first used to introduce his concept of time presented another, related model of time and mind. For, like many late Aristotelian authors, Hobbes also discussed how time relates to the functioning of the mind. This is apparent from the structure of the annihilatory hypothesis itself, because in order to consider the phenomena of space and time we imagine privation, and then *remember* the presence and motion of bodies. Indeed, for the hypothetical man remaining after the annihilation, “there can be nothing for him to think upon but what is past.”<sup>69</sup> Hobbes suggested that the fact that the human mind exists in, and relates to, time in different ways structures our very understanding of natural philosophy. His treatment of time in the second part of *De Corpore* therefore began with privation, but also with a relationship between time and the mind that he presented in two different, but yet related, forms. The first involved the argument that time is subjective and depends on the mind: the second, that the human subject fundamentally operates and orients itself in time.

The notion that the mind and soul exist and operate in time is familiar from late Aristotelian psychology. However, as with his argument that time is a psychological construction, this general similarity should not blind us to important and specific differences between Hobbes' psychology and that of his late Aristotelian contemporaries. Like Descartes, Hobbes rejected many key elements of the Aristotelian science of the soul, chief among which was the concept of a separate intellect or intellective power. The fact that Hobbes denied the existence of an eternal rational faculty in the human soul had clear implications for his discussion of time. This denial of the Aristotelian intellect was related to a more fundamental shift within his psychology: whilst late Aristotelian authors essentially considered how the faculties of the soul think and sense, Hobbes considered how *man* thinks and senses. In many respects, his psychology

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<sup>69</sup> Hobbes, *English Works*, vol. I, 92.

aimed to present a theory of the human subject, and not the soul, orienting itself in time. Nevertheless, he also preserved elements of the Aristotelian account of time and the soul, together with some recognisably Aristotelian terminology, including an emphasis on the primacy of sense-perception. I believe that although this characterization of Hobbes' psychology highlights important continuities between his philosophy and the late Aristotelian tradition, his approach was in fact more complex. Hobbes drew on aspects of Aristotelian natural philosophy in his discussion of what I have called the 'psychology of time', but I believe that this discussion was ultimately motivated by specifically political concerns that the Aristotelian authors discussed in earlier chapters lacked.

Discussions of the way in which time relates to and structures the mind feature in three of Hobbes' works dealing with psychology from the 1640s onwards: *The Elements of Law* (1640), the critique of White, and *Leviathan* (1651). Both *The Elements of Law* and *Leviathan* developed a specifically political psychology—that is, a theory of the mind that was ultimately designed to support a broader political philosophy—but his response to White was less overtly polemical, and in some respects more philosophically eclectic and interesting. In all three works, I believe that Hobbes' treatment of this aspect of time and the mind contained two key strands: the first concerned the relationship between time, reason and prudence, and can be read as an attempt to redefine the way that time relates to reason, in the absence of the Aristotelian intellect. The second strand concerned the relationship between time and the passions. However, underlying both strands, and to an extent motivating the whole discussion, is a concern with the epistemological and psychological problems and possibilities of the future. This concern had a specific political purpose within Hobbes' philosophy, which becomes most clear in *Leviathan*, where the two aspects of the relationship between time and the mind introduced in the annihilatory hypothesis were reconciled.

The psychology of the *The Elements of Law* again began with the notion of annihilation, although in this case Hobbes did not discuss space and time, focusing instead on the fact that mental images remain in the absence of external objects. These mental images, or "imagery and representations of the qualities of things without us," he argued, are that which "we call our cognition, imagination, ideas, notice, conception, or knowledge of them."<sup>70</sup> Conceptions of external objects remain and are preserved in memory,

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<sup>70</sup> Thomas Hobbes, *The Elements of Law, Natural and Politic*, ed. Ferdinand Tönnies (2nd edn. London: Frank Cass, 1969), 2.

"insomuch that if a man could be alive, and all the rest of the world annihilated, he should nevertheless retain the image thereof."<sup>71</sup> Having begun by asserting the importance of memory and the past, Hobbes continued his analysis of the causes of mental operations by considering the present time, arguing that "Originally all conceptions proceed from the actions of the thing itself, whereof it is the conception. Now when the action is present, the conception it produceth is called SENSE, and the thing by whose action the same is produced is called the OBJECT of sense."<sup>72</sup> Hobbes' account of sensation was anti-Aristotelian in many respects, for he denied the existence of sensible species, and argued that, following from the annihilatory hypothesis, images or colours inhere in our minds, and not in external objects. As he put it, "...as in conception by vision, so also in the conceptions that arise from other senses, the subject of their inherence is not the object, but the sentient."<sup>73</sup> Chapter Two of *The Elements of Law* was a sustained attack on many key Aristotelian assumptions about sensation and optics, but it was framed by a structure that assigned different mental functions to different times. As for many late Aristotelian authors, for Hobbes sense was associated with the present time.

The analogy between mental operations and different parts of time was continued in Hobbes' discussion of imagination. Imagination, or 'phantasy' is essentially a sense-impression after time has elapsed, or "conception remaining, and little by little decaying from and after the act of sense."<sup>74</sup> Later in the same chapter, he distinguished between the terms 'imagination' and 'phantasy', which he defined as an image produced "when the action of sense hath been long or vehement: and the experience thereof is more frequent in the sense of seeing, than the rest."<sup>75</sup> An example of a phantasm is "the image remaining before the eye after a steadfast looking upon the sun."<sup>76</sup> Imagination and phantasy are present mental images, viewed from the perspective of the past: but they do not involve a reflexive element, or conscious awareness of the past as past. Hobbes reserved this role for what he called 'REMEMBRANCE'. In his discussion of remembrance, Hobbes showed his debt to the Aristotelian discourse of the internal and external senses, arguing that

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<sup>71</sup> *Ibid.*, 2.

<sup>72</sup> *Ibid.*, 3.

<sup>73</sup> *Ibid.*, 3–4.

<sup>74</sup> *Ibid.*, 8.

<sup>75</sup> *Ibid.*, 10.

<sup>76</sup> *Ibid.*, 10.

By the senses (which are numbered according to the organs to be five) we take notice (as hath been said already) of the objects without us; and that notice is our conception thereof: but we also take notice some way or other of our conceptions. For when the conception of the same thing cometh again, we take notice that it is again; that is to say, that we have had the same conception before; which is as much as to imagine a thing past; which is impossible to sense, which is only of things present. This therefore may be accounted a sixth sense, but internal, not external, as the rest, and is commonly called REMEMBRANCE.<sup>77</sup>

This is an important passage for a number of reasons. It indicates that Hobbes adapted the traditional discourse of the internal and external senses to fit with his argument about the relationship between time and mental faculties. As we have seen, in late Aristotelian psychology the notion that the five external senses cannot be aware of their own sense-activity was commonplace, since this self-reflexive ability was usually restricted either to reason or to the common sense. Hobbes, however, telescoped the various Aristotelian internal senses into one—remembrance—that operates in a specifically temporal way. Remembrance consists of a reflexive awareness of past sense-impressions, and thus produces the awareness that the mind has sensed objects *in time*. It goes further than the standard Aristotelian assumption that man can be aware of his own sensations by locating this reflexive awareness in time. However, Hobbes argued that remembrance is necessarily limited by the fact that imagination is *decaying* sense; that is, “it is said to be a conception by little and little decaying, or growing more obscure.”<sup>78</sup> The clarity of our mental representations deteriorates over time, so that

a man that is present in a foreign city, seeth not only whole streets, but can also distinguish particular houses, and parts of houses; departed hence, he cannot distinguish them so particularly in his mind as he did, some house or turning escaping him; yet is this to remember the city; when afterwards there escapeth him more particulars, this is also to remember, but not so well. In process of time, the image of the city returneth, but as of a mass of building only, which is almost to have forgotten it.<sup>79</sup>

Absence and presence, Hobbes suggested, can be construed either in spatial or temporal terms, so that “To see at a great distance of place, and to remember at great distance of time, is to have like conceptions of the

<sup>77</sup> *Ibid.*, 10–11.

<sup>78</sup> *Ibid.*, 11.

<sup>79</sup> *Ibid.*, 11.

thing: for there wanteth distinction of parts in both; the one conception being weak by operation at distance, the other by decay.”<sup>80</sup>

Hobbes’ discussion of sense and remembrance associated both processes with specific times, and he argued that the way in which mental representations or conceptions are produced and processed is deeply temporal. However, *The Elements of Law* developed this insight into an argument that mental discourse, and the operation of our passions, is also temporal. Individual sense-impressions, or conceptions, and their decaying counterpart, imagination, are joined together in an orderly sequence or mental succession that Hobbes calls ‘DISCURSION.’ Discursion, or mental discourse, is the mind’s way of proceeding from one conception to another, as from cause to effect. Hobbes gives several examples of the forms of discursion. The first is ‘RANGING’, where the mind looks for something from an arbitrary beginning, such as “a man’s casting his eye upon the ground, to look about for some small thing lost; the hounds casting about at a fault in hunting; and the ranging of spaniels.”<sup>81</sup> The other forms of ‘discursion’ are ‘SAGACITY’, which begins with an appetite or passion, “where honour, to which a man hath appetite, maketh him think upon the next means of attaining it . . . ,” and ‘REMINISCENCE’ (which he distinguishes from remembrance), where mental discourse begins “with appetite to recover something lost, proceeding from the present backward, from the thought of the place where we miss it, to the thought of the place from whence we came . . . till we have in our mind some place, wherein we had the thing we miss.”<sup>82</sup>

The form of discourse to which Hobbes paid most attention, however, was experience. Experience is “nothing else but remembrance of what antecedents have been followed with what consequents,” and individual memories of antecedent and consequents are called experiments.<sup>83</sup> It is, in a sense, a mental sequence derived from a temporal sequence of events. Hobbes’ discussion of experience was concerned particularly with its relationship with past and future time. He argued that our experience of the future is dependent on both memory and experience, for “No man can have in his mind a conception of the future, for the future is not yet. But of our conceptions of the past, we make a future; or rather, call

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<sup>80</sup> *Ibid.*, 11–12.

<sup>81</sup> *Ibid.*, 14.

<sup>82</sup> *Ibid.*, 14.

<sup>83</sup> *Ibid.*, 14–15.

past, future relatively.”<sup>84</sup> Thus “after a man hath been accustomed to see like antecedents followed by like consequents, whensoever he seeth the like come to pass to any thing he had seen before, he looks there should follow it the same that followed then.”<sup>85</sup> The connection between antecedent and consequent, when applied specifically to present events, draws on remembered experience to produce a conception of the future. Thus “consequent unto that which is present, men call future. And thus we make remembrance to be prevision or conjecture of things to come, or EXPECTATION or PRESUMPTION of the future.”<sup>86</sup> A similar process can occur in relation to past events, so that “if a man seeth in present that which he hath seen before, he thinks that that which was antecedent to what he saw before, is also antecedent to that he presently seeth.”<sup>87</sup> This assumption, which is in a sense the opposite of ‘expectation’, “is called CONJECTURE of the past, or presumption of fact.”<sup>88</sup>

Hobbes codified this relationship between memory, experience and the future though the concept of signs. Signs are connections established in the mind between commonly-observed antecedents and consequents, so that “When a man hath so often observed like antecedents to be followed by like consequents, that whensoever he seeth the antecedent, he looketh again for the consequent; or when he seeth the consequent he maketh account there hath been the like antecedent; then he calleth both the antecedent and consequent, SIGNS of one another . . .”<sup>89</sup> For example, clouds are a sign of future rain, and rain a sign of past clouds. Signs codify causal and temporal relations between external objects, offering man a way of predicting future events from past ones. However, Hobbes was clear that they cannot establish certainty about these events, for “these signs are but conjectural; and according as they have often or seldom failed, so their assurance is more or less; but never full and evident; for though a man hath always seen the day and night to follow one another hitherto; yet can he not thence conclude they shall do so, or that they have done so eternally.”<sup>90</sup> Therefore the virtue of prudence, which Hobbes redefined as “nothing else but conjecture from experience, or taking of signs from experience warily,” is both an unsound guide to predict future events and

<sup>84</sup> *Ibid.*, 15.

<sup>85</sup> *Ibid.*, 15.

<sup>86</sup> *Ibid.*, 15.

<sup>87</sup> *Ibid.*, 15.

<sup>88</sup> *Ibid.*, 15.

<sup>89</sup> *Ibid.*, 15.

<sup>90</sup> *Ibid.*, 16.

an unsafe basis upon which to found knowledge.<sup>91</sup> Hobbes emphasized the distinction between the secure knowledge of reason, which he called “science, or knowledge of the truth of propositions,” which deals with definitions and names and is atemporal, and the conjectural, insecure knowledge provided by prudence and the system of signs, which is temporal because it involves the mind processing past and future events.<sup>92</sup> He characterized the latter, prudential form of knowledge as “nothing but sense, or knowledge original . . . and remembrance of the same.”<sup>93</sup> Here, Hobbes essentially argued that the awareness of the external world posited by the annihilatory hypothesis, and the connection it establishes between past and future time and the mind, is an unsatisfactory basis for firm knowledge of that world. This argument, which owed much to Hobbes’ uncertainty about the epistemological status of the future, can also be related to his position concerning the Aristotelian intellect. For although he denied the existence and role of a separate intellect, Hobbes made a similar distinction to many late Aristotelian authors between the atemporal nature of rationality and the temporal awareness of the world that we acquire through our senses. However, unlike his late Aristotelian contemporaries, for him reason had no connection whatsoever to time.

Hobbes’ discussion in *The Elements of Law* about the way in which the mind engages with time also encompassed the relationship between time and the passions. This is a complex and interesting examination, which has received relatively little scholarly attention. Hobbes first tackled the function of passion: passions are ‘acts’ of the “power motive of the mind . . . by which the mind giveth animal motion to that body wherein it existeth.”<sup>94</sup> Motive power moves the body to action through the passions. However, the structure of passion is more complex. Hobbes argued that “that motion and agitation of the brain, which we call conception . . . [is] . . . continued to the heart, and there . . . called passion.”<sup>95</sup> Passion provokes bodily motion, but is itself provoked by ‘conception’.

Conceptions are “images . . . of the things without us,” produced by “the actions of the thing itself.”<sup>96</sup> All passion results from different conceptions in the brain.<sup>97</sup> Hobbes distinguished three kinds of conception, which

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<sup>91</sup> *Ibid.*, 16.

<sup>92</sup> *Ibid.*, 24.

<sup>93</sup> *Ibid.*, 24.

<sup>94</sup> *Ibid.*, 27–8.

<sup>95</sup> *Ibid.*, 31.

<sup>96</sup> *Ibid.*, 2–3.

<sup>97</sup> *Ibid.*, 31.

relate to different times: "... one is of that which is present, which is sense; another, of that which is past, which is remembrance; and the third, of that which is future, which we call expectation."<sup>98</sup> This triad is of course familiar from contemporary *De Anima* commentaries and from treatises on the passions, but Hobbes altered its meaning somewhat.<sup>99</sup> Present conceptions are sense-impressions, and conceptions of past sense-impressions are stored as memories. Conceptions of the future, however, initially seem more problematic for Hobbes. To understand them, this passage needs to be read in the context of his earlier arguments about the future. Hobbes argued that man is capable of extrapolating from the past into the future, and that we 'create' the future using our imagination and the material of past conceptions.

The conceptions that produce passion concern the past, present and future, and we therefore experience passions that concern these times. Hobbes focused particularly on present and future passions. Present passions are immediate, sensual pleasures and pains, such as delight in music, or disgust at a bad smell.<sup>100</sup> They result from sense-impressions, and their objects are immediately present. Present passions for Hobbes proceed from the 'conceptions' produced by sense and are relatively simple phenomena. Passions that concern the future, though, are more complicated. Future passions "consist in conception of the future, that is to say, in conception of power past, and the act to come..."<sup>101</sup> This unusual formulation needs to be unpacked. Hobbes had already stated that a conception of the future is impossible, but that nevertheless man can extrapolate an image of the future from his "remembrance of what is past."<sup>102</sup> In order to explain how a conception of the future produces a *passion* that regards the future, however, he introduced the concept of power: "we so far conceive that anything will be hereafter, as we know there is something at the present that hath power to produce it. And that anything hath power now to produce another thing hereafter, we cannot conceive, but by remembering that it hath produced the like heretofore."<sup>103</sup> Therefore, passions that regard the future require us to extrapolate on the basis of past experience of our own power.

<sup>98</sup> *Ibid.*, 32.

<sup>99</sup> Aristotle, *On the Soul: Parva Naturalia: On Breath*, 291.

<sup>100</sup> Hobbes, *Elements of Law*, 32–3.

<sup>101</sup> *Ibid.*, 34.

<sup>102</sup> *Ibid.*, 33.

<sup>103</sup> *Ibid.*, 33–4.

Hobbes' concept of power was complicated because it involved both the "faculties of mind and body... that is to say, of the body, nutritive, generative, motive; and of the mind, knowledge," and the 'acquired' powers of "riches, place of authority, friendship, or good favour."<sup>104</sup> Hobbes's discussion of the mental and bodily faculties here was indebted to Aristotelian psychology. However, he saw power as a composite of psychic abilities and experience; thus we know we have the power to achieve something if we have previously achieved it through our own faculties or our social status. Therefore, the idea of a subject existing and experiencing events in time is also important here. To experience a passion for the future is to consider one's present and past ability, so passion becomes an act of self-reflection and self-situation in time. Many other contemporary theorists argued that passions are experienced in time, but Hobbes expanded this point by explaining the basis upon which passions regard objects in the past, present and future. Whilst working within an inherited tradition of Aristotelian faculty psychology, his account of the temporality of passion was based on his own theory of 'conceptions'.

Hobbes's argument about passion and time contained much that is new, but he was also indebted to his contemporaries and to earlier authors. Certainly, Hobbes' argument owed something to the account of passion in Aristotle's *Rhetoric*. Hobbes translated and summarized the *Rhetoric* in 1637 whilst he was tutor to the Cavendish family, and John Aubrey reported his favourable opinion of the text.<sup>105</sup> Further evidence of Hobbes's 'Aristotelity' in this respect is his use of Aristotle's tripartite model of memory, sense and expectation. Hobbes certainly referred to and adapted Aristotelian concepts, but he also developed an original theory of time and passion. Essentially, the treatment of passion in the *The Elements of Law* was a complex mix of contemporary and Aristotelian ideas about passion and time, Aristotelian faculty psychology and real innovation.

Another account of the role of time in the structure and operation of the mind appeared in Hobbes' critique of White. Although he repeated some themes and arguments from *The Elements of Law*, Hobbes also explored

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<sup>104</sup> *Ibid.*, 34.

<sup>105</sup> John T. Harwood, ed., *The Rhetorics of Thomas Hobbes and Bernard Lamy* (Carbondale: Southern Illinois University Press, 1986), 1–2. John Aubrey, *Brief Lives and Other Writings* (London: The Cresset Press, 1949), 255: "I have heard him say that Aristotle was the worst teacher that ever was, the worst politician and ethick... but his rhetorique and discourse of animals was rare."

other ways in which time and the mind are connected. Some of this material appeared only in the critique of White, a fact that might be explained either by the radical nature of some of his ideas and the response of the Mersenne circle, or perhaps by the idiosyncratic nature of the work itself. The critique of White was one of the few occasions on which Hobbes presented his psychology without a related political argument. Unlike *The Elements of Law* and *Leviathan*, Hobbes' response to White lacked a specifically political agenda, and as a result allowed him to develop some of his ideas more fully.

Hobbes' discussion of the psychology of time in the critique of White began with the notion of sense. In his treatment of nodus two of the third dialogue, he discussed White's argument that incorporeal beings can move, even though they are not themselves moved, focusing specifically on the example White used of 'the soul in animals'.<sup>106</sup> This is a classic example of Hobbes' strategy in the critique, for as well as rejecting White's argument, he presented material of his own on animal souls. This material was paraphrased in Mersenne's *Ballistica* (1644).<sup>107</sup> The materialist account that Hobbes gave of the soul is similar in many respects to that of *The Elements of Law*, taking as its starting point the assumption that "every sense-perception [*sensio*] occurs through the action of objects."<sup>108</sup> External motions produce motions in the sense-organs, which are then transmitted via the nerves to the heart, to be "repulsed or returned through the reaction and resistance of the heart to the outward parts of the animal."<sup>109</sup> These returned motions are "phantasms that appear to be external," such as light or colour in vision, or sound in hearing.<sup>110</sup> Sense impressions, Hobbes argued, are internal appearances produced by internal motion, and which

<sup>106</sup> Hobbes, *Critique du De mundo*, 326: "Inductionem autem illam, qua dicit pag 275 usos esse philosophos, ad duo illo axiomata colligenda, propter prolixitatem simul & absurditatem missam faciens, accedo ad exemplum quo utitur author ipse ad ostendum quomodo incorporea, etsi non mota, possunt tamen movere, nimurum exemplum animae in animalibus, de cuius actione pauca sunt hic praemittenda."

<sup>107</sup> Schuhmann, "Hobbes dans les publications de Mersenne en 1644," 2–4.

<sup>108</sup> Hobbes, *Critique du De mundo*, 326: "Sciendum igitur, sensiōnem omnem fieri per actionem objectorum, nempe visionem per motum a lucido vel illuminato corpore per medium continuo a parte in partem propagatum, perque oculum usque ad cerebrum, atque etiam ad ipsum cor..."

<sup>109</sup> *Ibid.*, 326: "Hi motus repulsi sive retro procreati per reactionem & resistentiam cordis usque ad partes animalis extimas..."

<sup>110</sup> *Ibid.*, 326: "...sunt phantasmata illa externe apparentia quae vocamus, in visione quidem lucem, vel colore, in auditu sonum..."

are caused ultimately by external motion. Therefore, “all sense-perception [*sensio*] is a motion in the parts of the body of an animal ...”<sup>111</sup>

Hobbes also introduced the element of time and duration. For, he argued, the mental images formed from external motion have an enduring aspect that allows us to distinguish between different forms of mental representation. Hobbes argued that “The object that causes itself to be sensed being removed, the motion excited by it in the brain and in the heart does not immediately cease.”<sup>112</sup> The remaining or enduring in being of this motion is another kind of mental representation, however. Therefore, he suggested, “Let it not be called *sense* longer than the object acts; nevertheless, the same motion remains under the name of *imagination*, which weakens little by little, and at last after a long time vanishes unless it is renewed by a similar motion.”<sup>113</sup> These mental images are fleeting because they are rapidly replaced in the conscious mind by new sense-perceptions: only in the unconscious, dreaming mind are images as strong as immediate perceptions.<sup>114</sup> Different mental images are distinguished according to time, in that “Imagination is therefore nothing other than continued sense ...”<sup>115</sup> Moreover, memory is also a form of imagination or continued sense; this is evident, he suggested, from the fact that a memory of one thing leads to another, in a chain or sequence that Hobbes called “the discourse of the soul [*discursus animae*]”.<sup>116</sup> This is motivated at least in part by Hobbes’ opposition to White’s argument that the soul consists of a series of actions that occur at once in time, rather than in a temporal sequence.

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<sup>111</sup> *Ibid.*, 327: “Denique omnis sensio est motus in partibus corporis animalis (quae partes, etsi vocentur spiritus animales, et vitales, sunt tamen corpora) ab obiectis (quae objecta sunt etiam corpora) excitatus ...”

<sup>112</sup> *Ibid.*, 327: “Objecto, quod sentiri se faciebat, remoto, non statim cessat motus ab eo in cerebro & corde excitatus ...”

<sup>113</sup> *Ibid.*, 327: “Non diutius quidem appelletur *sensio* quam objectum agat; manet tamen motus idem sub nomine *imaginationis*, quae paulatim debilior fit, & tandem longo tempore evanescit, nisi a simili motu renovetur.”

<sup>114</sup> *Ibid.*, 327: “Caeterum, quod ita debiles sint imaginationes etiam statim post sensationem ut faciei semel visae pene obliviscamus simul atque convertimur, id non provenit a debilitate motus, sed ab actione praesenti aliorum sensibilium quae in vigilantes semper agunt incumbentes, at in dormientibus ubi nulla actio ab externo impedit *imaginationes* quae vocantur somnia, aequae fortes sunt ac ipsae *sensiones*.”

<sup>115</sup> *Ibid.*, 327: “Imaginatio ergo cum non sit aliud quam sensio continuata ...”

<sup>116</sup> *Ibid.*, 327: “Memoriam autem, imaginationem esse nemo dubitare potest; a memoria ergo unius rei deduci in memoriam alterius, id est imaginis ad imaginem consequitio, quae vocatur *discursus animae* ...”

White believed that if the soul as an unmoved mover were to plan the construction of a house (a traditional Aristotelian example), it would consider the parts of that building, but would not enter into its construction unless it were certain that a definite end existed; he also argued that “these and similar actions the soul would not be able to do, unless it were at once itself a long series of actions, or if it had this series within it.”<sup>117</sup> That is, White seems to have felt that the series of actions that the soul performs exist within it, or are identified with it. For Hobbes, this was like arguing that the soul that plans a house must *be* that house; in the case of building, it is “as if soul were such a series of actions and also were not a series, but was all at once in time.”<sup>118</sup> Part of his difficulty with White’s argument apparently stemmed from the way that it conflated two concepts of the operation of the soul: one temporal and sequential, and the other instantaneous. This point about sequence was reiterated later in the same section, where Hobbes criticized White’s contention “that in our imagination it is necessary that one [body] gives way to another.” Hobbes argued that “this contradicts what he said before, that the soul is certainly a series of actions together and at once; for it seems to me that he wishes by these words to signify that the whole series of imaginations is not only in the soul, but that it *is* the soul itself.”<sup>119</sup> Such metaphysics, he suggested, would make Lucian himself laugh. However, Hobbes’ reaction to White was more than merely derisory, for in response to his opponent’s alleged confusion he attempted to formulate a model of mental discourse and mental operations that emphasized the notion of temporal sequence.

This argument was developed in Chapter Thirty, which deals with Nodus Five of White’s third dialogue (*‘Ens a se unicum esse & caeterorum causam’*), where White examined the question of God’s existence and will by first considering these faculties within the human soul.<sup>120</sup> Hobbes took this opportunity to advance his own views on the nature of the soul, in

<sup>117</sup> *Ibid.*, 328.

<sup>118</sup> *Ibid.*, 328: “Imo animam oportet esse ingressiōnem viae, comportationem materiae, positionem fundamenti, aedificationem murorum, & c. omnia simul & semel, ita ut anima sit series actionum talis ut non sit series, sed simul tempore.”

<sup>119</sup> *Ibid.*, 328–9: “Innuit scilicet duas animas eodem loco simul esse posse, at in *imaginatione nostra* necesse, inquit, *est ut praetervoleat unum quo alteri locum cedat*, contradicens, ut mihi videtur, iis quae dixerat ante, nimurum animam esse seriem omnium actionum simul & semel; videbatur enim mihi voluisse iis verbis significare totam series imaginacionum simul esse non modo in anima sed esse ipsam animam.”

<sup>120</sup> *Ibid.*, 349: “Ingressurus disputationem de Divino Intellicu, pag. 307, recte interrogat, *Dic, itaque mihi quid est intelligere?* Subiungit autem, non recte, inquirendum esse *inter ea quae hominibus propria sunt*, neque enim ipse arbitratur Divinum Intellectum similem

an argument that follows on from his earlier discussion of animal souls in Chapter Twenty-Seven.<sup>121</sup> Hobbes again asserted that “Sense-perception and all phantasms are such motions as we have described.”<sup>122</sup> Again, the argument that the internal motions that constitute our mental representations of the external world endure within the mind for a certain time follows from this initial premise. Hobbes compared this remaining in being of mental motion to the motion of air and of liquids, which can be stopped only by gravity. He suggested that the spirits that flow around the body, however, are not affected by gravity because of their circular course. Hence, “There is no reason why the motion (of which phantasies are constituted) should be extinguished except over a long period of time.”<sup>123</sup> Hobbes also repeated his earlier argument about the essentially identical nature of mental representations here; what differentiates these representations is both the presence or absence of the external object that caused them and the time that has elapsed since the representation was produced. Of the various motions present in the body, that which exists in the heart at any one moment is the ‘present phantasm’, which has different names depending on the sense-organ in question.<sup>124</sup> In the absence of the object that caused the passion or sensation the mental representation is termed an ‘imagination’, but Hobbes argued that this imagination is the same thing as a sense-perception, “For it is called sense-perception for as long as it concentrates on the object, but when that object goes away, it has the name ‘imagination’, taken from imaginations in vision.”<sup>125</sup>

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esse intellectui humano; sed quoniam de intellectu humano inquiri iubet, id jam faciendum est.”

<sup>121</sup> *Ibid.*, 347: “Demonstraciones eius tunc examinabo, quando de natura facultatum animae ego etiam aliquid praemisero, id quod faciam perberviter . . .”

<sup>122</sup> *Ibid.*, 350: “Summa denique huius articuli esto sensionem, et phantasma omne esse motum talem quidem qualem diximus.”

<sup>123</sup> *Ibid.*, 350: “Quid autem motum corporum liquidorum, quales sunt spiritus animalis, & ipse sanguis, extinguere potest, praeter gravitatem, eo modo quo motus aëris & aquae sistitur, difficile conceptus est, quoniam autem neque spiritus in corpore animalis saltem *vegeto* (neque forte sanguis) omnino gravitat, sed cursu quodam circulari ad servitia singulorum membrorum circumcursat, nulla est ratio quare motus (in quo consistunt phantasmata) nisi longo tempore extingueretur.” Mersenne emended the last phrase in this sentence to “nisi post tempore extinguitur debent.”

<sup>124</sup> *Ibid.*, 350: “Ex multis autem motibus ita, ut dictum est, generatis, is qui in corde dominatur praesens phantasma est; quod quidem, dum obiectum ipsum agit, dici solet pro differentia organorum per quae actio fiebat, diverse.”

<sup>125</sup> *Ibid.*, 350–1: “. . . et ipsa quidem passio, *sensio* appellatur, remoto autem obiecto agente, idem motus sive phantasma manens, dici solet *imaginatio*, ita ut imaginatio cum sensione eadem sit res. Nominatur autem sensio tantisper dum incumbit obiectum, illo autem abeunte, nomine sumpto ab imaginibus, in visione, *imaginatio*.”

Hobbes' argument so far followed his earlier discussion of animal souls, but he also introduced a new element: the notion that each mental motion or representation is innately temporal. This, he argued, is because

Since imagination is a motion, and every motion consists of a succession, it is necessary that imagination should also consist of succession, and that it should always have in itself something prior to the present, and it is because of this that the same motion which, without any consideration of the past, we call imagination, we also call memory when we wish to consider the past, just as an imagination of the past without any consideration of its *phantasma*, that is an imaginary succession itself, is called time.<sup>126</sup>

Hobbes' argument here represented a bridge between his accounts of time as an imagination of motion, and of how time operates within the mind. He argued that mental images are innately temporal, and that the notion of time itself is simply a peculiar kind of mental image. However, the identification of motion with succession does not exactly follow from his earlier definition of motion in Chapters Five and Fourteen of the *De Mondo Examined*. Here, he argued that motion is "the constant relinquishing of one place and the acquisition of another": a body moves when it quits one place and assumes another.<sup>127</sup> Presumably, he inferred that motion can therefore be described in terms of a succession of places, although this is something of a slide. Any moving body will leave and acquire a sequence of places, so motion cannot be described without considering those places that have been left behind. On this basis, each mental image contains both an element of the past and a sense of progression from past to present. Hobbes thus argued here that we cannot perceive an object, or retain a mental image of that object that is static. Rather, every mental phantasm contains a succession within itself that determines the way in which we perceive it: a sequence of mental images is created in the mind, because sequence is inherent in the images themselves. This is an interesting argument, not least because of the central role that it assigned to succession within the mind. Motion conceived of as a succession (or as a movement

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<sup>126</sup> *Ibid.*, 351: "Quoniam autem imaginatio motus est, motus autem omnis constat successione, necesse est ut imaginatio quoque conset successione, habeatque in se semper aliquid praesente prius, atque ob hanc rem est quod eundem motum quem sine consideratione praeteriti vocamus imaginationem, quoties etiam praeteritam considerare volumus, *memoriam* appellamus, sicut imaginatio praeteriti absque consideratione ipsius phantasmatis, nempe ipsa successio imaginaria, vocatur *tempus*."

<sup>127</sup> *Ibid.*, 128: "Moveri autem (sive motus) est locum alium continuo relinquere alium acquirere..." Also, see *Ibid.*, 202.

from past to present place) was present in the mental images which are the building-blocks of Hobbes's psychology.

Hobbes used the notion of succession to expand the argument about time and sequence presented earlier. The concept of time as an imaginary mental sequence makes more sense if one accepts his contention that each mental image or perception contains a notion of succession; time as an imaginary motion relates to the succession that is inherent in all sense-perception. As Hobbes put it, "a mind-picture of the past without consideration of its phantasm, that is, an imaginary succession, is called time."<sup>128</sup> Hobbes's language is a little unclear here, but he seems to have meant that we can abstract a notion of time from our mental phantasms by leaving out the image itself (*absque consideratione phantasmatis*), retaining only the idea of succession. This process of abstraction is possible only because the images themselves contain an idea of succession, or rather "contain something that precedes the present time."<sup>129</sup> Thus, although time can be whatever we will, it also derives from a notion of succession within the mind; this is a gloss on Hobbes's earlier assertion that time consists of "motion in him who imagines."<sup>130</sup> As imagination contains an element of succession, time as an imaginary motion is constructed from images that themselves contain a sequence.

This concept of sense and sequence differs from that found in Hobbes's other works. For, whilst the psychology of *Leviathan* and *De Corpore* treats sense-perception in broadly the same way, neither work suggests that all mental images (*phantasma*, *memoria*, *imaginatio*, and *sensio*) are the *same* motion, or that every motion contains a notion of sequence. Chapters One and Two of *Leviathan* ('Of sense' and 'Of imagination') identify imagination and memory, "which for divers considerations hath divers names," but carefully distinguish them from sense itself: imagination is not simply another name for a sense-impression, but is instead 'decaying sense'.<sup>131</sup> Moreover, whilst the account of sense-perception in Chapter One of *Leviathan* closely resembles that of Chapter Thirty of *De Mundo Examined* and *The Elements of Law*, in his later work Hobbes did not link the motion that produces mental images to an idea of sequence, or

<sup>128</sup> *Ibid.*, 351: "... sicut imaginatio praeteriti absque consideratione phantasmatis, nempe ipsa successio imaginaria, vocatur *tempus*."

<sup>129</sup> *Ibid.*, 351: "Quoniam autem imaginatio motus est, motus autem omnis constat successione, necesse est ut imaginatio quoque constet successione, habeatque in se semper aliquid praesente prius..."

<sup>130</sup> *Ibid.*, 332: "Est enim motus imaginatio, idem quod motus in imaginante..."

<sup>131</sup> Hobbes, *Leviathan*, 15–16.

suggest that a phantasm "must always contain something that precedes the present time."

In Chapter Twenty-Five of *De Corpore*, however, Hobbes argued that "sense ... hath necessarily some memory adhering to it, by which former and later phantasms may be compared together, and distinguished from one another."<sup>132</sup> Superficially, this argument resembled that of the *De Mundo Examined*. However, it becomes clear that in *De Corpore* Hobbes meant not so much that phantasms *contain* a past element, or a sequence, but that we can remember and compare sense-impressions. The 'memory' that 'adheres' to sense is in fact "the motion in the organ, by which the phantasm is made", which remains "there for some time, and ... [makes] ... the phantasm return."<sup>133</sup> It does not show that the sense-impression *itself* is a sequence. This notion of the essentially temporal nature of mental images was thus unique to the *De Mundo Examined*. Hobbes used his critique of White to develop a different version of his psychology of sense-perception from that which appeared in his published work. Whilst Hobbes's later works, and *The Elements of Law*, argued that the production of sense-impressions is based on external and mental motion, only the *De Mundo Examined* stated that the images or mental motions produced involve a succession and relate to the past as well as to the present.

Hobbes' critique of White also developed an argument about our ability to operate and orient ourselves in time that depended on a similar concept of memory and the future to *The Elements of Law*. He argued that "For just as there is memory of the things that we sense, there is also memory of the succession of one thing to another or of event to event, or the memory of antecedent and consequent, that should be called 'experiment' [*experimentum*]."<sup>134</sup> Someone who has observed and remembered many experiments, "that is, many consequences of things... is said to have experience of many things."<sup>135</sup> Thus "he who is familiar with many apparent consequences, if afterwards when he sees an event similar to a past event, he will also think that it will be followed by another event

<sup>132</sup> Hobbes, *English Works*, vol. I, 393. See Jeffrey Barnouw, "Hobbes' Causal Account of Sensation," *Journal of the History of Philosophy* 18 (1990): 115–130 for a discussion of this passage, although Barnouw does not mention the *De mundo Examined* in this context.

<sup>133</sup> Hobbes, *English Works*, vol. I, 393.

<sup>134</sup> Hobbes, *Critique du De mundo*, 353: "Sicut autem est rerum ipsarum quas sensimus, ita etiam est unius rei ad aliam sive eventus ad eventum successionis, sive antecedentis & consequentis memoria, quae vocari solet *experimentum*."

<sup>135</sup> *Ibid.*, 353: "...et qui multa experimenta, id est multas rerum consequentias, observarit & meminerit, habere dicitur multam rerum experientiam."

similar to the one that followed that past event.”<sup>136</sup> Hobbes illustrated this relationship between antecedent and consequent with the same weather analogy he used in *The Elements of Law*; we both expect rain when we see a cloud, and infer that there has been a cloud when it rains.<sup>137</sup> This, he argued, is “because an imagination of the future is nothing other than an imagination of the past.”<sup>138</sup> However, we make an imagination of the past into a conception of the future by creating or supposing a connection with the present, “by assuming similar present and past events, not to be similar, but to be the same number.”<sup>139</sup> From this assumption, we further infer “through our supposition and imagining” that “an event that has really preceded a previous event seems to follow it”; but “whatever comes after the present, is called *future*.”<sup>140</sup> Our awareness of the future is a kind of memory, in that it is constructed from stored past sense-impressions; prudence, or foreknowledge of the future equate to ‘much experience’.<sup>141</sup>

The relationship between signs and time established in *The Elements of Law* was also discussed in the critique of White. Here, Hobbes argued that a sign is “the consequent of an antecedent and the consequent of an antecedent.”<sup>142</sup> Similarly, cause and effect are signs of each other.<sup>143</sup> Hobbes departed from his earlier argument, however, in his discussion of animals’ use of signs; for just as the *De Mundo Examined* takes the topic of animal souls seriously as a subject of inquiry, it is also more willing to

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<sup>136</sup> *Ibid.*, 353: “Rursus qui iam expertus est multas consequentias similes, postea si quando rursus viderit eventum similem eventui praeterito, putabit quoque ei secuturum esse eventum alium similem eius qui secutus est eventum illum praeteritum.”

<sup>137</sup> *Ibid.*, 353: “Exempli causa, qui videt nubem densam ideo expectabit pluvia secuta sit. Similiter idem nubem praecessisse putabit cum pluisse videat, quia prius ita contigisse meminerat.”

<sup>138</sup> *Ibid.*, 353: “Cuius rei ratio necessaria est, quia futuri imaginatio alia non est quam imaginatio praeteriti.”

<sup>139</sup> *Ibid.*, 353: “Cuius ordinem cum praesenti supponimus sive fingimus connexum cum praesenti, non tanquam similes sed tanquam eundem numero . . .”

<sup>140</sup> *Ibid.*, 354: “. . . atque ita fit ut eventus qui praecedentem revera antecessit, suppositione & fictione nostra sequi videatur, quicquid autem praesenti postponitur, id *futurum* appellatur.”

<sup>141</sup> *Ibid.*, 354: “Quemadmodum autem experimentorum memoria *experientia* dicitur respectu praeteriti, ita eadem respectu futuri vocatur *expectatio*, ideoque experientia multa eadem res est cum prudentia, sive futuri providentia, quae sine experientia nulla est, atque inde est quod senes habent experientiae.”

<sup>142</sup> *Ibid.*, 354: “Iam qui similitudinem consequotionis eventuum observaverunt & meminerunt, illis antecedens consequentis & consequens antecedentis *signum* dicitur, signum itaque est antecedens consequentis, & consequens antecedentis illis qui similia antecedenti memineri[n]t semper vel plerumque sequuta esse similia consequente.”

<sup>143</sup> *Ibid.*, 354: “Hinc autem colligitur causas & effectus expertis *signa* mutua esse propter consequiam unam ad alterum.”

attribute complex (and temporal) mental operations to animals. Hobbes argued that “with regard to this the faculties of man and of other animals do not differ, for other animals sense and imagine, and invent, and from imagination of one thing are lead to another (which is to discourse) . . .”<sup>144</sup> Hobbes argued that “many other animals besides man also have memory and foresight of the future, that is experience and prudence.”<sup>145</sup> This is why, he suggested, “they both love those who care for them, and fear others, that is, they expect future evil from those who have harmed them in the past, and they infer the future by signs, as men do . . .”<sup>146</sup> Hobbes thus also attributed many of the temporal mental powers of man to other animals, although he stopped short of implying that animals also share rationality with man; for none of these examples of animal prudence amount to reason, “which is properly fitting to man alone.”<sup>147</sup> The human soul is distinguished from those of beasts by its superior ability to compare past and future events, since animals are more often wrong about which events follow others, but also in its use of names and markers to aid the memory. Nevertheless, in this passage Hobbes went further than elsewhere in his published work towards suggesting a fundamental similarity in the ways in which man and other animals engage with time.

### *Time and the Political Subject*

A common thread emerges from the discussions of time in Hobbes’ natural philosophy and psychology. In his early natural philosophy, he developed the argument that time is fundamentally subjective, and can be seen in a twofold manner, as both a representation of motion and as imagination. He believed that our mental representations of time are subjective, because time as a representation of motion exists only in our minds; however,

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<sup>144</sup> *Ibid.*, 354: “Atque hactenus quidem facultates hominum, & coeterum animalium non differunt, sentiunt enim animalia coetera & imaginantur, & fingunt & ab imaginatione unius in imaginationem ducuntur alterius (quod est discurrere) . . .”

<sup>145</sup> *Ibid.*, 354: “. . .habent quoque memoriam praeteriti & providentiam futuri, hoc est experientiam & prudentiam, multa alia animalia praeter hominem.”

<sup>146</sup> *Ibid.*, 354: “Ex quibus & amant eos a quibus curantur, metuuntque illos, id est expectant ab iis futurum sibi malum a quibus mala antea passi sunt, signisque futura coniectant, aequae ac homines . . .”

<sup>147</sup> *Ibid.*, 354–5: “. . .ne commemorando cognitam multarum bestiarum solertia astutiam, & praesensionem videatur prudentia hominum postponenda; nulla itaque prae-dictarum facultatum aut intellectus aut ratio dicenda est, has enim oportet soli homini convenire.”

he also argued that we can imagine or create a time that is particular to us. Suggestive parallels existed between this concept of time and the notion of internal time adopted by the late renaissance Aristotelian authors I discussed in Chapter One. Like Hobbes, these textbook authors attributed particular times to individual beings and consequently believed that there are as many internal times as there are beings, although unlike him they generally believed time to be a form of duration, and represented internal time as the duration or life of a subject. As a result, for most late Aristotelian authors the individual being seldom played a role in *creating* its own time. For Hobbes, however, the time of the individual subject was certainly internal, since it existed only as an internal imagination or mental representation, but it was also strongly personal, because it related to the particular mental life of the individual. Hobbes' notion of particular, internal time prioritized the mental over the physical. Also, whilst late Aristotelian theories of internal time also posited an external time that acts as a common measure to unite the disparate internal times of individual beings, in his early natural philosophy Hobbes made no such concession. Time for him was both radically subjective and inseparable from the existence of the individual subject.

However, Hobbes' theory of time not only resembled the contemporary ideas of time as a rational being and of internal time, but also echoed late Aristotelian accounts of the psychology of time. In this instance, his use of Aristotelian paradigms and arguments was less straightforward, since his hostility to late Aristotelian assumptions about the intellect and the incorporeal soul necessarily distinguished his account of the human mind from theirs in many important respects. Nevertheless, in many respects his account of the role of time in the human mind represented a development of a theme adumbrated but never fully developed in the late Aristotelian tradition: that of the human subject existing and orienting itself in time. This was because for Hobbes time could not exist 'outside' the human mind. He believed that time can be created by the mind as a mental representation and imagined at the same time that the subject orients itself and exists *in* time.

In *Leviathan*, Hobbes developed these assumptions about man's status as a temporal subject in a way that had important implications for his concept of man as the subject of politics. This argument redeployed much of the material already discussed in this chapter. However, I believe that Hobbes' mature political theory in *Leviathan* showed a particular concern with the relevance of time to the political subject and to the state.

He began the first book of *Leviathan* with an account of sense, imagination (or 'decaying sense') and memory which broadly followed that of *The Elements of Law*; indeed, he presented a somewhat condensed account of sensation, stating simply that "To know the naturall cause of sense is not very necessary to the business now at hand; and I have else-where written of the same at large."<sup>148</sup> In the case of imagination, he presented the same argument that present sense-impressions gradually decay, "For the continual change of mans body, destroyes in time the parts which in sense were moved; So that distance of time, and of place, hath one and the same effect in us."<sup>149</sup> Hobbes' discussion in *Leviathan* of what he called "Foresight, and Prudence, and Providence" emphasizes his concerns about the epistemological uncertainty inherent in any attempt to know the future. He argued here that

the Present only has a being in Nature; things Past have a being in the Memory only, but things to come have no being at all; the Future being but a fiction of the mind, applying the sequels of actions Past, to the actions that are Present; which with most certainty is done by him that hath most experience; but not with certainty enough.<sup>150</sup>

Hobbes' description of the future as a 'fiction of the mind' was significant because it recalled the discussion in the *De Mundo Examined* of created and imagined time. Prudence, which is merely a form of 'Presumption' is based on man's ability to guess at the future according to a system of signs, based on antecedents and consequents: thus he suggested that he "who hath the most experience in any kind of businesse, has most Signes, whereby to guesse at the Future time; and consequently is the most prudent."<sup>151</sup> Prudence is therefore "a Praesumption of the Future, contracted from the Experience of time Past," which Hobbes again contrasted with the certain and atemporal nature of reason.<sup>152</sup> It is a form of understanding that requires the human subject to engage itself in time, by drawing on past experience to create a kind of fiction of the future. For Hobbes, the future at which we 'guesse' is a fiction both because it is unreal and because our mind constructs it. His concern with the future was therefore not directed solely at its epistemology, but also at its psychology. The

<sup>148</sup> Hobbes, *Leviathan*, 13.

<sup>149</sup> *Ibid.*, 16.

<sup>150</sup> *Ibid.*, 22.

<sup>151</sup> *Ibid.*, 22–3.

<sup>152</sup> *Ibid.*, 23.

notion of fictional, imagined time discussed in the *De Mondo Examined* took a different form in *Leviathan*, because in Hobbes' later work prudence was presented as an unreliable way of *imagining* the future. However, Hobbes also developed an argument about the social and psychological problems that follow this kind of speculation. Contemplating future objects and events, he argued, may have harmful consequences. This pathology of the future had two strands, involving anxiety and anticipation.

Hobbes first connected anxiety and the future in Chapter Twelve of *Leviathan*. Here, he repeated the claim that it "is peculiar to the nature of Man, to be inquisitive into the Causes of the Events they see."<sup>153</sup> However, he also suggested that men are particularly concerned with the causes of future goods and evils. This curiosity distinguishes them from 'Beasts', but it also leads to mental distress. For, although considering the future is a natural human activity, our ability to do so with any certainty is limited. Men are "assured that there be causes of all things that . . . shall arrive hereafter," but are largely incapable of discerning them. This incapacity leads to fear and 'Anxiety'.<sup>154</sup> For "it is impossible for a man, who continually endeavoureth to secure himself against the evill he feares, and procure the good he desireth, not to be in a perpetual solicitude of the time to come."<sup>155</sup> Looking to the future is an anxious business, and too much prudence makes men unhappy. Hobbes expanded this point through an extraordinary image, arguing that,

every man, especially those that are over-provident, are in an estate like to that of *Prometheus*. For as *Prometheus*, (which interpreted is *The prudent man*,) was bound to the hill *Caucasus*, a place of large prospect, where, an Eagle feeding on his liver, devoured in the day, as much as was repayed in the night; So that man, which looks too far before him, in the care of future time, hath his heart all the day long, gnawed on by feare of death, poverty, or other calamity; and has no repose, nor pause of his anxiety, but in sleep.<sup>156</sup>

Hobbes's reading of the Prometheus myth was unusual, not least because it shifted the emphasis of the account given by classical authors such as Aeschylus and Hesiod, and by renaissance mythographers and authors of emblem books.<sup>157</sup> Both Aeschylus and Hesiod associated Prometheus,

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<sup>153</sup> *Ibid.*, 76.

<sup>154</sup> *Ibid.*, 76.

<sup>155</sup> *Ibid.*, 76.

<sup>156</sup> *Ibid.*, 76.

<sup>157</sup> On the development of the Prometheus myth, see Raymond Trousson, *Le Thème de Prométhée dans la Littérature Européene* (Geneva: Librairie Droz, 1964).

who stole fire from Zeus to benefit mankind, with accurate knowledge of the future. Correspondingly, they interpreted Prometheus's name as 'fore-thought' or 'fore-thinker'. However, Hobbes inflected his account differently. His etymological sleight of hand was subtle but important: he replaced 'fore-thought' with 'foresight'. His Prometheus, just like any other '*prudent man*', does not know what will happen, but rather looks before him in a vain and anxious attempt to 'see' the future.<sup>158</sup> Again, Hobbes associated prudence with the metaphor of sight. For him the future implied not knowledge but occluded vision and heightened tension.

However, Hobbes's discussion of the pathology of the future had another strand. In his treatment of the state of nature, Hobbes introduced the concept of 'Anticipation'.<sup>159</sup> Anticipation stems from 'diffidence', or a lack of faith in others, and involves natural men looking to the future and speculating about the actions of others, then taking pre-emptive action in an attempt to preserve themselves. In the state of nature, Hobbesian man looks to the future to consider the evils that may result from others' actions, and consequently seeks, "by force, or wiles, to master the persons of all men he can, so long, till he see no other power great enough to endanger him."<sup>160</sup> Whilst the individual considering future events becomes anxious, attempts in the state of nature to anticipate and predict the actions of others lead inevitably to war. Ultimately, Hobbes believed that a focus on the future produces conflict in the present. The passion of fear was central to Hobbes' account of the psychological problems of the future. Fear for Hobbes is a temporal passion. For, as he stresses in *De Cive*, it consists of "any anticipation of future evil."<sup>161</sup> Therefore, when natural man 'looks forward' to future evils, he fears the future time as much as he anticipates it. Fear connects the two strands of Hobbes' argument about the psychological problems of the future, but it also pervades man's experience of the future more generally.

Hobbes' discussion of prudence, fear and the future centred on a notion of man orienting himself in, and relating to, time. In this sense, his conception of the human subject was deeply temporal. In *Leviathan*, this notion of individual subjectivity in time overshadowed the account of the

<sup>158</sup> In *De Cive*, however, Hobbes offers a different reading of the myth, explaining that Prometheus represents 'human intelligence' creating aristocracy and democracy from monarchy: Thomas Hobbes, *On the Citizen*, transl. Michael Silverthorne and Richard Tuck (Cambridge: Cambridge University Press, 1998), 117n, 118.

<sup>159</sup> Hobbes, *Leviathan*, 87–8.

<sup>160</sup> *Ibid.*, 87–8.

<sup>161</sup> Hobbes, *On the Citizen*, 25.

relationship between time and individual mental processes given in his earlier work. Each man in state of nature thinks about, and experiences, time in a wholly subjective way that, through the concept of anticipation, makes him act “to master the persons” of others; there is no shared, external measure of time, just as there are no other common values. This is the situation described in the *Elements of Law*, where Hobbes argued that “In the state of nature, every man is his own judge, and differeth from every other concerning the name and appellations of things, and from those differences arise quarrels, and breach of peace.”<sup>162</sup> Time is particularly potent example of these contested meanings. Man in the state of nature in *Leviathan* constructs fictions of the future, anticipates the actions of others, and is motivated by the temporal passion of fear. The state of nature is a war of all against all that occurs in time, but it is also in a sense a conflict *between* particular times. Each individual has a personal or internal notion of time, but through the effects of fear and anticipation these times conflict with each other and contribute to the wider conflict of the state of nature. In this respect, the state of nature is a political refiguring of the Aristotelian problem of the unity of time, and the culmination of the arguments about the subjectivity of time found in Hobbes’ earlier work.

If the state of nature in *Leviathan* is a representation of the problems of internal time, then the Hobbesian state offers men the chance to resolve these problems. Hobbes repeatedly associated the possibility of instituting a common measure or ‘account’ of time, which his late Aristotelian predecessors characterized as ‘external time’, with the institution of the commonwealth. In *De Cive*, he noted that the benefit that “... comes to human life from observation of the stars, from mapping of lands, from *reckoning of time* and from long-distance navigation ... whatever in short distinguishes the modern world from the barbarity of the past” is possible only within the commonwealth.<sup>163</sup> He repeated this point in Chapter Thirteen of *Leviathan*, where he argued that in the state of nature, “no Navigation, nor use of the commodities that may be imported by Sea; no commodious Buildings, no Instruments of moving, and removing such things as require much Force; no Knowledge of the Face of the Earth; *no account of Time*; no Arts, no Letters, no Society” were possible.<sup>164</sup> Thus what Hobbes called “the greatest commodities of mankind,” “namely, of measuring matter

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<sup>162</sup> Hobbes, *Elements of Law*, 188.

<sup>163</sup> Hobbes, *On the Citizen*, 4; my italics.

<sup>164</sup> Hobbes, *Leviathan*, 89; my italics.

and motion; of moving ponderous bodies; of architecture; of making instruments for all uses of calculating the celestial motions, the aspects of the stars, and *the parts of time* . . . These benefits are enjoyed by almost all of the people of Europe, by most of those of Asia: but the Americans, and they that live near the Poles, do totally want them.<sup>165</sup> One of the 'Incommodities' of man's natural state is the fact that "no account of Time," conceived of as a common external measure, exists there.<sup>166</sup> As we have seen, only the particular, individual times of individual subjects can exist in the state of nature. The temporal emotion of fear may be "The Passion to be reckoned upon," but time itself can be 'reckoned' only within the commonwealth.

Hobbes had suggested the mechanism by which this 'reckoning' might be instituted in the *Elements of Law*, where he argued that

it was necessary there should be a common measure of all things that might fall in controversy; as for example: of what is to be called right, what good, what virtue, what much, what little, what *meum* and *tuum*, what good, what a pound, what a quart &c. For in these things private judgements may differ, and beget controversy. This common measure, some say, is right reason: with whom I should consent, if there were any such thing to be found or known *in rerum naturâ*. But commonly they that call for right reason to decide any controversy, do mean their own. But it is certain, seeing right reason is not existent, the reason of some man, or men, must supply the place thereof; and that man, or men, is to he or they, that have the sovereign power, as hath already been proved.<sup>167</sup>

Time is a contested meaning that has a particularly strong connection to the experience of the individual subject. It poses a problem that needs to be resolved by the sovereign, who institutes a single definition by which his subjects must abide. In this sense, Hobbes' sovereign is not only "King of all the children of pride," but also the master of time.<sup>168</sup> He 'governs' time in the most absolute manner imaginable: not by redirecting the attention of his subjects away from past or future objects, but by deciding what time itself is. Hobbes' use of a watch or clock in *Leviathan* as a metaphor for the functioning of commonwealth is well-known, but the commonwealth itself also functions as a kind of public clock, in which the sovereign imposes a common, external measure of time on his subjects.

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<sup>165</sup> *Ibid.*, 89; my italics.

<sup>166</sup> *Ibid.*, 89.

<sup>167</sup> Hobbes, *Elements of Law*, 188–9.

<sup>168</sup> Hobbes, *Leviathan*, 221.

Like God himself, who created time, after the institution of the state Hobbes' 'mortall God' reconciles competing subjective notions of time. This was a political solution to a psychological and metaphysical problem that was first formulated in very different terms by Hobbes' late Aristotelian contemporaries.

## CONCLUSION

### TIME AND THE SCIENCE OF THE SOUL BETWEEN DISCIPLINES

This book has traced the career of a particular approach to time and the soul across a range of philosophical disciplines from the sixteenth to the mid-seventeenth century, emphasizing the extent to which time as an object of knowledge spoke to concerns within natural philosophy, psychology and, ultimately, in ethics and politics. Although the emphasis throughout has been on the connections evident in late Aristotelian philosophy between time and the science of the soul, a central strand of my argument has been that to ignore the extent to which discussions of time migrated across disciplinary boundaries in this period is to miss a crucial dimension of this discourse. Similarly, the relationship between the Aristotelian, scholastic tradition analysed in the first part of the book and the *novatores* discussed in the second part was neither wholly antagonistic nor utterly amiable. Setting the approach of early modern scholastic and Aristotelian authors in the context of discussions of time in the philosophy of Descartes and Hobbes reveals how these later authors adapted and also rejected arguments originating in the philosophy of the schools. As I have shown, the thread connecting the late Aristotelian commentators and textbook authors to Hobbes and Descartes, who traversed some of the same intellectual terrain on diverging paths, is not straightforward, but it is highly significant for the way in which we conceive of theories of time in this period.

In the Introduction, I noted the uncertain voice in which so many sixteenth- and seventeenth-century Aristotelian and scholastic authors discussed the question of time in general, and in particular the connections they identified between time and the soul. Uncertainty might seem an unpromising mood in which to begin a book, but yet it was a central characteristic of the late scholastic approach to time. The reasons that late Aristotelian commentators most commonly gave for these demonstrations of anxiety were in part textual, and it was indeed difficult for even charitable readers to unpack some of Aristotle's claims in *Physics* IV. However, it is also true that some of this uncertainty must have stemmed from the difficulty of negotiating the place of time within the distinct discourses of metaphysics, natural philosophy and psychology. A pessimistic

interpretation of the dialogue between concepts of time in the various disciplines might emphasize the inherent discontinuity and inconsistencies produced by this approach, and the extent to which it fuelled the ambiguity and uncertainty to which most early modern Aristotelians confessed when faced by the problem of time. Certainly, the Aristotelian authors discussed in the first part of the book were not always able, given the textual and intellectual resources available to them, to give a unified account of this problem: in particular, the distinction between the ontology of time offered in *Physics* commentaries, and the vision both of time within the soul and of the intellect positioning itself within a temporal world in the *De Anima* tradition (what I have called the 'psychology of time'), was never entirely bridged in this period. It is also possible, however, to see their willingness to think through the problem of time in a variety of contexts as evidence of a readiness to conceptualize the problem in broader terms than those possible in the language of some of their contemporary opponents and later critics. It is perhaps worth remembering that the self-confident alternatives proposed by many of the most vociferous critics of the scholastic philosophy of time, which ultimately moved time firmly within the domain of a natural philosophy that held little place for the soul, had no anxiety about explaining the phenomenon of time, but also few insights into its connection with psychology or ethics. To a great extent, then, the approach followed by Hobbes, in which claims about the character of time originating in his natural philosophy supported a political argument about man's innate and problematic temporality, represents the culmination of a complex tradition that grew out of, and in some respects transcended, its scholastic and Aristotelian context.

## BIBLIOGRAPHY

### *Printed Primary Sources*

Albertus Magnus. *Opera omnia*. 37 vols., Aschendorff, 1951–1999.

Alsted, Johann Heinrich. *Scientiarum omnium encyclopaedia*. Lyon: Sumptibus Ioannis Antonii Huguetan filii, & Marc Antonii Ravard, via Mercatoria ad insigne Sphaerae, 1649.

Aquinas, St. Thomas. *Liber de veritate catholicae fidei contra errores infidelium seu Summa contra gentiles*. Rome: Marietti, 1961.

—. *Commentary on Aristotle's Physics*, transl. Richard J. Blackwell, Richard J. Spath and W. Edmund Thirlkel. London: Routledge and Kegan Paul, 1963.

—. *Summa theologiae*, ed. and transl. the Dominican Fathers, 61 vols. London: Blackfriars, 1964–1980.

Aristotle, *The Complete Works of Aristotle: The Revised Oxford Translation*, edited by Jonathan Barnes. 2 vols. Princeton: Princeton University Press, 1984.

—. *On the Soul: Parva Naturalia: On Breath*. Translated by W.S. Hett. Cambridge: Harvard University Press, 1936.

Arriaga, Rodericus. *Cursus philosophicus*. Antwerp: Ex officina Plantiniana Balthasaris Moreti, 1632.

Aslacus, Conradus. *Physica & ethica mosaica, ut antiquissima, ita vere christiana, duobus libris*. Hanover: Typis Wechelianis, apud haeres Ioannis Aubtii. 1613.

Aubrey, John. *Brief lives and other writings*. London: The Cresset Press, 1949.

Augustine. *Confessions*. Translated by R. Pine-Coffin. Harmondsworth: Penguin, 1961.

Averroës. *Aristoteli de physico auditu libri octo, cum Averroës Cordubensis variis in eosdem commentariis*. Venice: Apud Junctas, 1562.

Aversa, Raffaele. *Philosophia, metaphysicam physicamque complectens quaestionibus contexta, in duos tomos distributa. Tomus primus*. Bononiae: Ducciae, 1650.

Babington, Gervase. *Certaine plaine, briefe, and comfortable notes, upon every chapter of Genesis*. London: Thomas Charde, 1596.

Bartholin, Caspar. *Enchiridion physicum ex priscis et recentioribus philosophis accurate cocinnatum, et controversiis naturalibus potissimis, utilissimisque illustratum*. Strasbourg: Sumpitus Eberhardi Zetzneri, 1625.

Burgersdijk, Franco. *Idea philosophiae naturalis sive methodus definitionum & controversiam physicarum*. Leiden: Ex officina Elsevir, 1627.

Case, John. *Lapis philosophicus, seu commentarius in 8 lib Phys Aristotelis in quo arcana physiologiae examinantur*. Oxford: Excudebat Josephus Barnesius, 1599.

—. *Ancilla philosophiae, seu epitome in octo libros Physicorum Aristotelis*. Frankfurt, 1600.

Casmann, Otto. *Psychologia anthropologica, sive animae humanae doctrina*. Hanau: Apud Guilielmum Antonium, impensis P. Fischeri, 1594.

—. *Secunda pars anthropologiae, hoc est fabrica humani corporis*. Hanoviae: Apud Guilielmum Antonium, impensis Petri Fischeri, 1596.

Cavellus, Hugo. *Doctoris subtilis Io Duns Scotus quaestiones super libris Aristoteles de Anima... & commentario, seu annotationibus longioribus illustratae atque discussae*. Lyon: Sumpitus Claudi Landry, 1625.

Ceriziers, René de. *Le philosophe françois tome I*. Paris: Chez Charles Argot, rue Saint Iacques, à la Ville de Leyden, 1658.

Complutense, Collegium. *Disputationes in tres libros Aristotelis de anima*. Paris: Sumpitus Dionysii Thierry, via Iacobaea, sub signo S. Dionysii prope D. Benedictum. 1633.

—. *Disputationes in octo libros physicorum Aristoteles*. Paris: Apud Dionysium Thierry, 1636.

Conimbricense, Collegium. *Commentarii collegii conimbricensis ex societate iesu in universam dialecticam Aristotelis stagiritae*. Cologne: Apud B. Gualterium, 1611.

—. *Commentariorum collegii conimbricensis societatis iesu, in octo libros physicorum Aristotelis stagiritae, prima pars*. Cologne, Sumptibus Haeredum Lazari Zetzneri, 1625.

—. *Commentarii collegii conimbricensis societatis iesu, in tres libros de anima Aristotelis stagiritae*. Cologne, Sumptibus Haeredum Lazari Zetzneri, 1629.

—. *Commentarii collegii conimbricensis societatis iesu, in quatuor libros de caelo, metereologicis & parva naturalia Aristotelis stagiritae*. Cologne: Sumptibus haeredum Lazari Zetzneri, 1631.

Crakanthorpe, Richard. *Introductio in metaphysicam*. Oxford: Excudebant Johannes Lichfield, & Jacobus Short, 1619.

D'Abra de Raconis, Charles. *Totius philosophiae ... tractatio*. Paris: Expensis D. de la Noue, 1617.

Dandinus, Hieronymus. *De corpore animato libri VII, luculentus in Aristotelis tres de anima libros, commentarius peripateticus*. Paris: Apud Claudium Chappeletum, 1610.

De Guevara, Ioannis. *De interiori sensu libri tres*. Rome: Ex typographia Iacobi Mascardi, 1622.

De Marandé, Leonard. *Abregé curieux et familier de toute la philosophie logique, morale, physique, & metaphysique, & des matieres plus importantes de Theologien François*. Lyon: Antoine Cellier, 1648.

Descartes, René. *Oeuvres*. Edited by C. Adam and P. Tannery. 11. vols. Paris: Vrin, 1894–1913.

—. *Descartes' Conversation with Burman*. Translated by John Cottingham. Oxford: Clarendon Press, 1976.

—. *The Philosophical Writings of Descartes: Volume II*. Translated by John Cottingham, Robert Stoothoff and Dugald Murdoch. Cambridge: Cambridge University Press, 1984.

—. *The Philosophical Writings of Descartes: Volume I*. Translated by John Cottingham, Robert Stoothoff and Dugald Murdoch. Cambridge: Cambridge University Press, 1985.

—. *The Philosophical Writings of Descartes: Volume III: The Correspondence*. Translated by John Cottingham, Robert Stoothoff, Dugald Murdoch and Anthony Kenny. Cambridge: Cambridge University Press, 1991.

Deusing, Anton. *Naturae theatrum universale, ex monumentis veterum, ad S. Scripturae normam, ac rationis & experientiae libellam extructum*. Harderwijk: Apud Nicolavm à Wieringen, 1644.

Dupleix, Scipion. *Corps de philosophie contenant la logique, la physique, la métaphysique et l'éthique*. Rouen: Chez Manassez des Preaulx, devant le Portail des Libraires, 1626.

Faba, Augustinus. *In tres Aristotelis libros de anima praeclarissima commentaria*. Seville: Apud Virgilium de Zagrandis, 1596.

Fernel, Jean. *The Physiologia of Jean Fernel*. Philadelphia: The American Philosophical Society, 2003.

Fonseca, Petrus. *Commentariorum ... in metaphysicorum Aristotelis stagiritae libros tomus secundus*. Cologne: Sumptibus Lazari Zetzneri Bibliopolae, 1615.

Gassendi, Pierre. *Opera omnia*. Edited by Nicolao Averanio. 6. vols. Florence: Typis regiae Celsitudinis apud Joannem Catejanum Tartini, & Sanctem Franchi, 1727.

—. *Disquisitio metaphysica, seu dubitationes et instantiae adversus Renati Cartesii metaphysicam et responsa*. Edited by Bernard Rochot. Paris: Vrin, 1962.

Goclenius, Rodolphus. *In M. Clementis Timpleri metaphysicam praefatio*. Hanau: Apud Guilielmum Antonium, 1606.

—. *Lexicon philosophicum, quo tanquam clave philosophiae fores aperiuntur*. Frankfurt: Typis viduae Matthiae Beckeri, impensis Petri Musculi & Ruperti Pistorij, 1613.

Gutierrez de Godoy, Johannes. *Disputationes phylosophicae, ac medicinae super libros Aristotelis de Memoria, & Reminiscencia, physicis utiles, medicis necessariae duobus libris contentae*. Jaen: Apud Petrum a Cuesta, Typographum Giennensem, 1629.

Harwood, John T., ed. *The Rhetorics of Thomas Hobbes and Bernard Lamy*. Carbondale, Southern Illinois University Press, 1986.

Havenreuter, Johann. *Compendium librorum physicorum Aristotelis*. Strasbourg: Typis Iosiae Rihelii, 1600.

Hobbes, Thomas. *The English Works of Thomas Hobbes of Malmesbury*. Edited by Sir William Molesworth. 11 vols. London: John Bohn, 1839.

—. *The Elements of Law, Natural and Politic*. Edited by Ferdinand Tönnies. 2nd edition. London: Frank Cass, 1969.

—. *Critique du De mundo de Thomas White*. Edited by Jean Jacquot and Harold Whitmore Jones. Paris: Vrin, 1973.

—. *Thomas White's De mundo Examined*. Translated by Harold Whitmore Jones. Bradford: Bradford University Press, 1976.

—. *Leviathan*. Edited by Richard Tuck. Cambridge: Cambridge University Press, 1996.

—. *On the Citizen*. Translated by Michael Silverthorne and Richard Tuck. Cambridge: Cambridge University Press, 1998.

—. *De Corpore*. Edited by Karl Schuhmann. Paris: Vrin, 1999.

Keckermann, Bartholomaeus. *Disputationes philosophicae, physicae praesertim, quae in Gymnasio Dantiscano ad lectionem philosophicarum cursum paulo plus biennio publice institutae & habitae sunt, sub praesidio Bartholomaei Keckermannii philosophiae in eodem Gymnasio Professoris*. Hanau: Apud Guilielmum Antonium, 1606.

—. *Operum omnium quae extant tomus primus*. Geneva: Apud Petrum Aubertum, 1614.

Leibniz, Gottfried Wilhelm. *The Leibniz-Clarke Correspondence: Together with Extracts from Newton's Principia and Opticks*. ed. H. G. Alexander (Manchester: Manchester University Press, 1956).

Liceti, Fortunio. *De intellectu agente libros v*. Passau: Apud Gasparem Crivellarium, 1627.

Locke, John. *An Essay Concerning Human Understanding*. Edited by P. H. Nidditch. Oxford: Clarendon Press, 1979.

Magirus, Johannes. *Anthropologia, hoc est commentarius eruditissimus in aurem Philippi Melanchthonis libellum de Anima*. Frankfurt: Wolfgang Richter, 1603.

—. *Physiologiae peripateticae libri sex cum commentariis*. Cambridge: Ex officina R. Danielis, 1642.

Mastrius, Bartholomaeus and Bonaventura Belluti. *Philosophiae ad mentem Scotti cursus integer*. Venice: Apud Nicolaum Pezzana, 1727.

Newton, Isaac. *The Principia: Mathematical Principles of Natural Philosophy*. Translated by I. Bernard Cohen and Anne Whitman. Berkeley: University of California Press, 1999.

Pareus, David. *In Genesim Mosis commentarius*. Frankfurt: In officina Ioanae Rhodii, 1615.

Perierius, Benedictus. *De communibus omnium rerum naturalium principiis & affectionibus, libri quindecim*. Rome: Impensis V. Tramezini, apud F. Zanettum, & B. Tosium, 1576.

—. *Commentariorum et disputationum in Genesim, tomi quatuor*. Cologne: Ex officina Antonii Hierati, sub Monocerote, 1606.

Poitiers, Pseudo Gilbert of. *Liber de sex principiis Gilberto Porretano ascriptus*. Monasterii: Typis Aschendorff, 1929.

Polus, Antonius. *Novum veritatis lumen in tres libros Aristotelis de anima*. Venice: Apud Simonem Galignanum, 1578.

Poncius, Johannes. *Philosophiae ad mentem Scotti cursus integer*. Lyon: Sumptibus Laurentii Anisson, 1672.

Ramus, Petrus. *Scholae in liberales artes*. Hildesheim: Georg Olms Verlag, 1970.

Rubeus, Johannes Baptista. *Commentaria dilucida in tres libros Aristotelis de anima*. Venice: Apud Ioannem Guerilum, 1602.

—. *Commentarii in universam Aristotelis dialecticam: una cum dubiis & quaestionibus hac tempestate agitari solitis...* London: Typis Tho. Harper, impensis Rich. Whitaker, apud quem prostant sub insignibus regalibus, in caementerio D. Pauli, 1641.

Rubio, Antonio. *Commentarii in Aristotelis de physico auditu seu auscultatione: una cum dubiis & quaestionibus hac tempestate agitari solitis*. Coloniae Agrippinae, 1629.

Sancto Paulo, Eustachius a. *Summa philosophiae quadripartita, de rebus dialeticis, ethicis, physicis & metaphysicis*. Cambridge: Ex officina Rogeri Danielis, 1649.

Scaynus, Antonio. *Paraphrasis... cum adnotationibus in libros Aristotelis de anima...* Venice, 1599.

Scheibler, Christoph. *Liber de anima*. Marburg: Apud Chemlinum, 1627.

Seidel, Bruno. *Physica*. Frankfurt. Ex officina M. Zachariae Palthenii, 1596.

Sennert, Daniel. *Epitome naturalis scientiae*. Oxford, 1632.

Simonius, Simon. *In liber Aristotelis... hoc est de sensum instrumentis & de his quae sub sensum cadunt, commentarius unus eiusdem in librum Aristotelis... hoc est de memoria & reminiscientia, commentarius alter*. Geneva: Apud I. Crispinum, 1566.

Stierius, Johann. *Praecepta doctrinae logicae, ethicae, physicae, metaphysicae sphaerique brevibus tabellis compacta*. Cambridge: Ex officina Rogeri Danielis, 1647.

Suárez, Francisco. *Metaphysicarum disputationum tomus duo*. Cologne: F. Heluidius, 1614.

Timpler, Clemens. *Metaphysicarum systema methodicum libri quinque*. Hanau: Apud Guilielmum Antonium, 1606.

—. *Physicae seu philosophiae naturalis systema methodicum, in tres partes digestum*. Hanau: G. Antonius, 1607.

Toletus, Franciscus. *Commentaria una cum quaestionibus in Aristotelis libros de anima*. Cologne: In officina Birckmann, 1594.

—. *Commentaria una cum quaestionibus in octo libros Aristotelis de physica auscultatione*. Venice: Apud Iuntas, 1616.

White, Thomas. *De mundo dialogi tres*. Paris: Apud Dionysium Moreaum, via Iacobaea, sub Salamandra, 1642.

—. *Peripateticall Institutions in the Way of that Eminent Person and Excellent Philosopher Kenelm Digby*. London: John Williams at the sign of the crown in S. Paul's church-yard, 1656.

Zabarella, Iacopo. *Commentarii... in III Aristotelis libros de anima*. Frankfurt: Sumptibus Lazar Zetzneri, 1606.

—. *De rebus naturalibus libri XXX*, Frankfurt: Sumptibus Lazar Zetzneri, 1607.

Zanardi, Michaeli. *Commentaria cum quaestionibus in tres libros de anima Aristotelis*. Cologne: Sumptibus Antonii Boëtzeri sub signo Rubei Leonis, 1622.

—. *Commentaria cum quaestionibus et dubiis in octo libros de physico auditu Aristotelis*. Cologne: Apud Antonium Boetzerum, 1622.

Zanchius, Hieronymus. *De operibus Dei intra spacium sex dierum creatis opus tres in partes distinctum*. Neustadt: Apud Nicholaum Schraummium, Impensis haeredum Wilhelm Harnisii, 1602.

#### Secondary Sources

Aertsen, Jan A., Emery Jr., Kent and Speer, Andreas, eds. *Nach der Verurteilung von 1277. Philosophie und Theologie an der Universität von Paris im letzten Viertel des 13. Jahrhunderts. Studien und Texte*. Berlin: Walter de Gruyter, 2001.

Alliney, Guido and Cova, Luciano, eds. *Tempus, aevum, aeternitas: la concettualizzazione del tempo nel pensiero tardomedievale*. Firenze: Olschki, 2000.

Annas, Julia. "Aristotle, Number and Time." *Philosophical Quarterly* 25 (1975): 97–113.

Ariew, Roger. "Descartes and Scholasticism: The Intellectual Background to Descartes' Thought." In *The Cambridge Companion to Descartes*, edited by John Cottingham, 58–90. Cambridge: Cambridge University Press, 1992.

—. "Les Principia et la *Summa philosophiae quadripartita*." In *Descartes: Principia philosophiae (1644–1994): atti del convegno per il 350° anniversario della pubblicazione dell'opera*, edited by Jean R. Armogathe and Giulia Belgioioso, 473–489. Naples: Vivarium, 1996.

—. *Descartes and the Last Scholastics*. Ithaca: Cornell University Press, 1999.

—. "Scotists, Scotists Everywhere." *Intellectual News* 8 (2000): 14–21.

—. "Descartes and the Jesuits: Doubt, Novelty and the Eucharist." In *Jesuit Science and the Republic of Letters*, edited by Mordechai Feingold, 157–194. Cambridge: MIT Press, 2003.

Ariotti, Piero. "Toward Absolute Time: The Undermining and Refutation of the Aristotelian Concept of Time in the Sixteenth and Seventeenth Centuries." *Annals of Science* 30 (1973): 31–50.

—. "Toward Absolute Time: Continental Antecedents of the Newtonian Conception of Absolute Time." *Studi internazionale di filosofia* 5 (1973): 141–168.

Arthur, Richard T.W. "Continuous Creation, Continuous Time: a Refutation of the Alleged Discontinuity of Cartesian Time." *Journal of the History of Philosophy* 26 (1988): 349–75.

Bakker, Paul J.J.M. "Natural Philosophy, Metaphysics, or Something in Between? Agostino Nifo, Pietro Pomponazzi, and Marcantonio Genua on the Nature and Place of the Science of the Soul." In *Mind, Cognition and Representation: The Tradition of Commentaries on Aristotle's De anima*, edited by P.J.J.M Bakker and J.M.M.H. Thijssen, 151–177. Aldershot: Ashgate, 2007.

Barnouw, Jeffrey. "Hobbes' Causal Account of Sensation." *Journal of the History of Philosophy* 18 (1990): 115–130.

Bettetini, Maria. "Measuring in Accordance with *dimensiones certae*: Augustine of Hippo and the Question of Time." In *The Medieval Concept of Time: Studies on the Scholastic Debate and its Reception in Early Modern Philosophy*, edited by Pasquale Porro, 33–53. Leiden: Brill, 2001.

Beyssade, Jean-Marie. *La philosophie première de Descartes: le temps et la cohérence de la métaphysique*. Paris: Flammarion, 1979.

Blair, Ann. "Mosaic Physics and the Search for a Pious Natural Philosophy in the Late Renaissance." *Isis* 91:1 (2000): 32–58.

Bloch, Olivier. "Gassendi critique de Descartes." *Revue Philosophique de la France et de l'étranger* 156 (1996): 217–236.

—. *La Philosophie de Gassendi: Nominalisme, Matérialisme et Métaphysique*. La Haye: Martinus Nijhoff, 1971.

Bonnen, Clarence and Flage, Daniel. "Descartes: The Matter of Time." *International Studies in Philosophy* 32 (2000): 1–11.

Boulnois, Olivier. "Du temps cosmique à la durée ontologique? Duns Scot, le temps, l'aevum et l'éternité." In *The Medieval Concept of Time: The Scholastic Debate and its Reception in Early Modern Philosophy*, edited by Pasquale Porro, 161–188. Leiden: Brill, 2001.

Brandt, Frithiof. *Thomas Hobbes' Mechanical Conception of Nature*. Copenhagen: Levin & Munksgaard, 1928.

Brockliss, Laurence W.B. *French Higher Education in the Seventeenth and Eighteenth Centuries: A Cultural History*. Oxford: Clarendon Press, 1987.

—. "Rapports de structure et de contenu entre les Principia et les cours de philosophie des Collèges." In *Descartes: Principia philosophiae (1644–1994): atti del convegno per il 350° anniversario della pubblicazione dell'opera*, edited by Jean R. Armogathe and Giulia Belgioioso, 491–516. Naples: Vivarium, 1996.

Burtt, Edwin Arthur. *The Metaphysical Foundations of Modern Physical Science: A Historical and Critical Essay*. London: Routledge and Kegan Paul, 1932.

Carvalho, Mario Santiago de. "The Concept of Time According to the Coimbra Commentaries." In *The Medieval Concept of Time: The Scholastic Debate and its Reception in Early Modern Philosophy*, edited by Pasquale Porro, 354–382. Leiden: Brill, 2001.

Coope, Ursula. *Time for Aristotle: Physics IV 10–14*. Oxford: Oxford University Press, 2005.

Crowley, Bonaventure. "The Life and Works of Bartholomew Mastrius, O.F.M. Conv. 1602–1673." *Franciscan Studies* 8 (1948): 97–152.

Daniel, Stephen. H. "Seventeenth-Century Scholastic Treatments of Time." *Journal of the History of Ideas* 42: 4 (1981): 587–606.

Dear, Peter. "The Meanings of Experience." In *The Cambridge History of Science, vol. III: Early Modern Science*, edited by Katharine Park and Lorraine Daston, 106–131. Cambridge: Cambridge University Press, 2006.

De Caylus, Dominique. "Merveilleux épanouissement de l'école scotiste au XVII<sup>e</sup> siècle." *Etudes Franciscaines* 24 (1910): 5–21.

Demonet, Marie-Luce. "Les êtres de raison, ou les modes d'être de la littérature." In *Res et Verba in der Renaissance*, edited by Ian W.F. Maclean and E. Kessler, 177–195. Wiesbaden: Harrassowitz in Kommission, 2002.

Des Chene, Dennis. *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought*. Ithaca: Cornell University Press, 1996.

—. *Life's Form: Late Aristotelian Conceptions of the Soul*. Ithaca: Cornell University Press, 2000.

—. *Spirits and Clocks: Machine and Organism in Descartes*. Ithaca: Cornell University Press, 2001.

Di Salle, Robert. "Newton's Philosophical Analysis of Space and Time." In *The Cambridge Companion to Newton*, edited by I. Bernard Cohen and George E. Smith, 33–56. Cambridge: Cambridge University Press, 2002.

Doyle, John P. "Prolegomena to the Study of Extrinsic Denomination in the Work of Francis Suarez, S.J." *Vivarium* 22 (1984): 121–160.

Ducheyne, Steffen. "J.B. Van Helmont's *De Tempore* as an Influence on Isaac Newton's Doctrine of Absolute Time." *Archiv für Geschichte der Philosophie* 90:2 (2008): 216–228.

Earman, John. *World Enough and Space-Time: Absolute versus Relational Theories of Space and Time*. Cambridge MA: MIT Press, 1989.

Edwards, Michael. "Aristotelianism, Descartes, and Hobbes." *Historical Journal* 50: 2 (2007): 449–464.

—. "Digressing with Aristotle: Hieronymus Dandinus' *De corpore animato* (1610) and the Expansion of Late Aristotelian Philosophy." *Early Science and Medicine* 13 (2008): 127–170.

—. "Body, Soul and Anatomy in Late Aristotelian Psychology." In *Form and Matter in Early Modern Philosophy*, edited by Gideon Manning, 33–75. Brill: Leiden, 2012.

—. "The Fate of Commentary in the Philosophy of the Schools, c.1550–1640." *Intellectual History Review* 22 (2012): 519–536.

Eschweiler, Karl. "Die Philosophie der spanischen Spätscholastik auf den deutschen Universitäten des siebzehnten Jahrhunderts." In *Spanische Forschungen der Görresgesellschaft* 1, 231–325. Munster: Aschendorff, 1928.

Esposito, Costantino. "The Concept of Time in the Metaphysics of Suárez." In *The Medieval Concept of Time: The Scholastic Debate and its Reception in Early Modern Philosophy*, edited by Pasquale Porro, 383–398. Leiden: Brill, 2001.

Evans, R.J.W. "German Universities After the Thirty Years War." *History of Universities* 1 (1981): 169–90.

Feingold, Mordechai. "Newton, Leibniz, and Barrow Too: An Attempt at a Reinterpretation," *Isis* 84: 2 (1993): 310–338.

—. "Mathematical Sciences and New Philosophies." In *The History of the University of Oxford Volume IV: Seventeenth-Century Oxford*, edited by Nicholas Tyacke, 359–448. Oxford: Clarendon Press, 1997.

Flasch, Kurt. *Was ist Zeit?: Augustinus von Hippo, das XI. Buch der Confessiones : historisch-philosophische Studie: Text, Übersetzung, Kommentar*. Frankfurt am Main: Klostermann, 1993.

Forlivesi, Marco. "Scotistarum princeps." *Bartolomeo Mastri (1602–1673) e il suo tempo*. Padua: Centro Studi Antoniani, 2002.

—. ed., "Rem in seipse cernere". *Saggi sul pensiero filosofico di Bartolomeo Mastri (1602–1673). Atti del Convegno di studi sul pensiero filosofico di Bartolomeo Mastri da Meldola (1602–1673), Meldola-Bertinoro, 20–22 settembre 2002*. Padua: Il Poligrafo, 2006.

Freedman, Joseph. *European Academic Philosophy in the Late Sixteenth and Early Seventeenth Centuries: The Life, Significance and Philosophy of Clemens Timpler (1563/4–1624)*. Hildesheim: Georg Olms, 1988.

—. "The Career and Writings of Bartholomew Keckermann (d.1609)." *Proceedings of the American Philosophical Society* 141: 3 (1997): 305–364.

Garber, Daniel. *Descartes' Metaphysical Physics*. Chicago: University of Chicago Press, 1992.

Garber, Daniel and Michael Ayers, eds. *The Cambridge History of Seventeenth-Century Philosophy*. 2 vols. Cambridge: Cambridge University Press, 1998.

Gilson, Etienne. *Jean Duns Scot: introduction à ses positions fondamentales*. Paris: Vrin, 1952.

—. *Index scholastico-cartésien*. 2nd edition. Paris: Vrin, 1979.

Grant, Edward. *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution*. Cambridge: Cambridge University Press, 1981.

Gueroult, Martial. *Descartes' Philosophy Interpreted According to the Order of Reasons*, 2 vols. Translated by Roger Ariew. Minneapolis: University of Minnesota Press, 1984.

Hamilton, J.J. "Hobbes' Study and the Hardwick Library." *Journal of the History of Philosophy* 16 (1978): 445–53.

Hanby, Michael. *Augustine and Modernity*. London: Routledge, 2003.

Harvey, E. Ruth. *The Inward Wits: Psychological Theory in the Middle Ages and the Renaissance*. London: Warburg Institute, 1975.

Hissette, R. *Enquête sur les 219 articles condamnés à Paris le 7 mars 1277*. Louvain: Publications Universitaires, 1977.

Hotson, Howard. *Johann Heinrich Alsted 1588–1638: Between Renaissance, Reformation and Universal Reform*. Oxford: Clarendon Press, 2000.

Hutton, Sarah. "Some Renaissance Critiques of Aristotle's Theory of Time." *Annals of Science* 34 (1977): 354–363.

—. *Aspects of the Concept of Time in Elizabethan and Jacobean England*. University of London Ph.D Thesis, 1977.

Jacquot, Jean. "Notes on an Unpublished Work of Thomas Hobbes." *Notes and Records of the Royal Society of London* 9 (1952): 188–195.

James, Susan. *Passion and Action: The Emotions in Seventeenth-Century Philosophy*. Oxford: Oxford University Press, 1999.

Jeck, Udo. *Aristoteles contra Augustinum: zur Frage nach dem Verhältnis von Zeit und Seele bei den antiken Aristoteleskommentatoren, im arabischen Aristotelismus und im 13. Jahrhundert*. Amsterdam: B.R. Grüner, 1994.

Kamiya, M. *La théorie cartésienne du temps*. Tokyo: Librairie—éditions France Toshō, 1982.

Kretzmann, Norman, Kenny, Anthony and Pinborg, Jan, eds. *The Cambridge History of Later Medieval Philosophy*. Cambridge, Cambridge University Press, 1982.

Kusukawa, Sachiko. *The Transformation of Natural Philosophy: The Case of Philip Melanchthon*. Cambridge: Cambridge University Press, 1995.

Lagerlund, Henrik, ed. *Forming the Mind: The Internal Senses and the Mind/Body Problem from Avicenna to the Medical Enlightenment*. Dordrecht: Springer, 2007.

Lapointe, Francois H. "The Origin and Evolution of the Term 'Psychology'." *Rivista critica di storia della filosofia* 28 (1973): 138–160.

Laporte, Jean. *Le rationalisme de Descartes*. Paris: Presses Universitaires de France, 1950.

Leijenhorst, Cees. "Jesuit Doctrines of *spatium imaginarium* and Thomas Hobbes' Doctrine of Space." *Early Science and Medicine* 1: 3 (1996): 355–380.

—. "Place, Space and Matter in Calvinist Physics." *The Monist* 84 (2001): 520–541.

—. *The Mechanisation of Aristotelianism: The Late Aristotelian Setting of Thomas Hobbes' Natural Philosophy*. Leiden: Brill, 2002.

Lennon, Thomas M. "Pandora: or, Essence and Reference: Gassendi's Nominalist Objection and Descartes' Realist Reply." In *Descartes and his Contemporaries: Meditations*,

*Objections, and Replies*, edited by Roger Ariew and Marjorie Grene, 159–181. Chicago: University of Chicago Press, 1995.

Levy, Ken. "Is Descartes a Temporal Atomist?" *British Journal for the History of Philosophy* 13: 4 (2005): 627–674.

Lewis, N. "Space and Time." In *The Cambridge Companion to Duns Scotus*, edited by Thomas Williams, 69–99. Cambridge: Cambridge University Press, 2003.

Lohr, Charles H. "Renaissance Latin Aristotle Commentaries: Authors A–B." *Studies in the Renaissance* 21 (1974): 228–289.

—. *Latin Aristotle Commentaries Volume II: Renaissance Authors*. Firenze: Olschki, 1988.

LoLordo, Antonia. *Pierre Gassendi and the Birth of Modern Philosophy*. Cambridge: Cambridge University Press, 2007.

McGuire, J. E. and Tamny, Martin. *Certain Philosophical Questions: Newton's Trinity Notebook*. Cambridge: Cambridge University Press, 2002.

Maclean, Ian. "Language in the Mind: Reflexive Thinking in the Late Renaissance." In *Philosophy in the Sixteenth and Seventeenth Centuries: Conversations with Aristotle*, edited by Constance Blackwell and Sachiko Kusukawa, 296–321. Aldershot: Ashgate, 1999.

—. "Aristotle's Infinities in the Late Renaissance." In *Au-delà de la "Poétique": Aristote et la littérature de la renaissance*, edited by Ullrich Langer, 123–137. Geneva: Droz, 2002.

—. "Cardano on the Immortality of the Soul." In *Cardano e la tradizione dei saperi*, edited by Marialuisa Baldi and Guido Canziani, 191–207. Milan: Francoangeli, 2003.

Maier, Annaliese. *Metaphysische Hintergründe der spätscholastischen Naturphilosophie*. Rome: Edizioni di storia e letteratura, 1955.

Malcolm, Noel. *Thomas Hobbes and Voluntarist Theology*. University of Cambridge PhD thesis, 1983.

—. *Aspects of Hobbes*. Oxford: Clarendon Press, 2002.

Marion, Jean-Luc. *On Descartes' Metaphysical Prism: The Constitution and Limits of Onto-Theo-Logy in Cartesian Thought*. Translated by Jeffrey L. Kosky. Chicago: University of Chicago Press, 1999.

Medina, José. "Le temps chez Hobbes." *Les études philosophiques* (1997): 171–190.

Menn, Stephen. *Descartes and Augustine*. Cambridge: Cambridge University Press, 1998.

Mooij, J.J.A. *Time and Mind: The History of a Philosophical Problem*. Leiden: Brill, 2005.

Moreau, Pierre-François. *Hobbes: Philosophie, Science, Religion*. Paris: Presses Universitaires de France, 1989.

Nutton, Vivian A. "Anatomy of the Soul in Early Renaissance Medicine." In *The Human Embryo: Aristotle and the Arabic and European Traditions*, edited by Gordon R. Dunstan, 136–57. Exeter: Exeter University Press, 1990.

O'Daly, G.J.P. "Augustine on the Measurement of Time: Some Comparisons with Aristotelian and Stoic Texts." In *Neoplatonism and Early Christian Thought: Essays in Honour of A. H. Armstrong*, edited by H.J. Blumenthal and R.A. Markus, 171–179. London: Variorum, 1981.

Pacchi, Arrigo. "Una biblioteca ideale di Thomas Hobbes: il MS E2 dell'archivio di Chatsworth." *Acme: annali della facoltà di lettere e filosofia dell'università degli studi di Milano* 21 (1968): 5–42.

Pasnau, Robert. "The Mind-Soul Problem." In *Mind, Cognition and Representation: The Tradition of Commentaries on Aristotle's De anima*, edited by Paul J.J.M. Bakker and J.M.M.H. Thijssen, 3–19. Aldershot: Ashgate, 2007.

Petersen, Peter. *Geschichte der Aristotelischen Philosophie in Protestantischen Deutschland*. Stuttgart—Bad Cannstatt: Friedrich Frommann Verlag, 1964.

Piché, David. *La condamnation parisienne de 1277. Texte latin, traduction et commentaire*. Paris: Vrin, 1999.

Pocock, John. "Time, History and Eschatology in the Thought of Thomas Hobbes." In *Politics, Language and Time: Essays in Political Thought and History*, edited by John Pocock, 148–201. London: Methuen, 1972.

Porro, Pasquale. *Forme e modelli di durata nel pensiero medievale: l'aevum, il tempo discreto, la categoria "Quando"*. Leuven: Leuven University Press, 1996.

Reif, Mary Richard. *Natural Philosophy in Some Early Seventeenth-Century Scholastic Textbooks*. Louis University Ph.D thesis, 1962.

Reif, Patricia. "The Textbook Tradition in Natural Philosophy, 1600–1650." *Journal of the History of Ideas* 30 (1969): 17–32.

Rochemonteix, Camille de. *Un collège de jésuites aux XVII<sup>e</sup> et XVIII<sup>e</sup> siècles: le collège Henri IV de La Flèche*, 4 vols. Le Mans: Leguicheux Imprimeur-Librairie, 1889.

Rochot, Bernard. *Les travaux de Gassendi sur Epicure et sur l'atomisme, 1619–1658*. Paris: Vrin, 1944.

—. "Sur les notions de temps et d'espace chez quelques auteurs du XVII<sup>e</sup> siècle, notamment Gassendi et Barrow." *Revue d'histoire des sciences* 9 (1956): 97–104.

Rodis-Lewis, Geneviève. "Une source inexplorée du Traité des Passions." *Revue philosophique de la France et de l'étranger* 138 (1948): 330–4.

—. "L'âme et la durée d'après une controverse cartésienne." *Revue internationale de philosophie* 4:12 (1950): 190–209.

Ross, D.C. "Time, the Heaven of Heavens, and Memory in Augustine's *Confessions*." *Augustinian Studies* 22 (1991): 191–205.

Rynasiewicz, Robert. "By Their Properties, Causes and Effects: Newton's Scholium on Time, Space, Place and Motion: Part I: The Text." *Studies in History and Philosophy of Science* (1995) 26: 133–153.

—. "By Their Properties, Causes and Effects: Newton's Scholium on Time, Space, Place and Motion: Part II: The Context." *Studies in History and Philosophy of Science* (1995) 26: 295–321.

Sandebothe, Mike. "The Temporalization of Time in Modern Philosophy." In *Time in Contemporary Intellectual Thought*, edited by Patrick Baert, 19–35. Amsterdam: Elsevier, 2000.

Schmaltz, Tad. *Radical Cartesianism: The French Reception of Descartes*. Cambridge: Cambridge University Press, 2002.

Schmitt, Charles B. *Aristotle and the Renaissance*. Cambridge: Harvard University Press, 1983.

—. *John Case and Aristotelianism in Renaissance England*. Kingston: McGill-Queen's University Press, 1983.

—. "The Rise of the Philosophical Textbook." In *The Cambridge History of Renaissance Philosophy*, edited by C.B. Schmitt, Q.R.D. Skinner et al., 792–804. Cambridge: Cambridge University Press, 1988.

Schmitt, Charles. B. and Skinner, Quentin, eds.. *The Cambridge History of Renaissance Philosophy*. Cambridge: Cambridge University Press, 1988.

Schuhmann, Karl. "Hobbes dans les publications de Mersenne en 1644." *Archives de philosophie* (*Bulletin Hobbes VII*) 58 (1995): 2–7.

—. "Zur Entstehung des neuzeitlichen Zeitbegriffs: Telesio, Patrizi, Gassendi." In *Karl Schuhmann. Selected papers on Renaissance philosophy and on Thomas Hobbes*, edited by Piet Steenbakkers and Cees Leijenhorst, 73–98. Dordrecht: Springer, 2004.

Secada, Jorge E.K. "Descartes on Time and Causality." *The Philosophical Review* 94:1 (1990): 45–72.

Serjeantson, R.W. "Hobbes and the Universities." In *The Philosopher in Early Modern Europe: The Nature of a Contested Identity*, edited by Conal Condren, Stephen Gaukroger and Ian Hunter, 113–39. Cambridge: Cambridge University Press, 2006.

—. "The Soul." In *The Oxford Handbook of Philosophy in Early Modern Europe*, edited by Desmond M. Clarke and Catherine Wilson, 119–41. Oxford: Oxford University Press, 2011.

Shapin, Steven. "Of Gods and Kings: Natural Philosophy and Politics in the Leibniz-Clarke Disputes." *Isis* 72: 2 (1981): 187–215.

Solère, Jean-Luc. "Descartes et les discussions médiévales sur le temps." In *Descartes et le moyen âge*, edited by Joël Biard and Roshi Rashed, 329–348. Paris: Vrin, 1997.

Sommervogel, Carlos. *Bibliothèque de la compagnie de Jesus*, 10 vols. Bruxelles: Schepens, 1890–1909.

Sorabji, Richard. *Emotion and Peace of Mind: From Stoic Agitation to Christian Temptation*. Oxford: Oxford University Press, 2000.

Southgate, Beverly. "Covetous of Truth": *The Life and Work of Thomas White*, 1593–1676. Dordrecht: Kluwer, 1993.

—. "Torn between Two Obligations: The Compromise of Thomas White." In *The Rise of Modern Philosophy: The Tension Between the New and Traditional Philosophies from Machiavelli to Leibniz*, edited by Tom Sorrell, 107–127. Oxford: Clarendon Press, 1995.

Stein, Howard. "Newtonian Space-Time." In *The Annus Mirabilis of Sir Isaac Newton 1666–1667*, edited by Robert Palter, 174–200. Cambridge, MA: MIT Press, 1967.

Taylor, Charles. *The Sources of the Self: The Making of Modern Identity*. Cambridge, MA: Harvard University Press, 1989.

Teske, Roland J. *Paradoxes of Time in Saint Augustine*. Milwaukee: Marquette University Press, 1996.

Thorndike, Lynn. *The History of Magic and Experimental Science*, 8 vols. New York: Columbia University Press, 1923–1958.

Toivanen, Juhana. "Peter Olivi on Internal Senses." *British Journal for the History of Philosophy* 15:3 (2007): 427–454.

Trifogli, Cecilia. *Oxford Physics in the Thirteenth Century (ca. 1250–1270): Motion, Infinity, Place and Time*. Leiden: Brill, 2000.

—. "Averroës' Doctrine of Time and its Reception in the Scholastic Debate." In *The Medieval Concept of Time: The Scholastic Debate and its Reception in Early Modern Philosophy*, edited by Pasquale Porro, 57–82. Leiden, Brill, 2001.

—. "Change, Time and Place." In *The Cambridge History of Medieval Philosophy*, edited by Robert Pasnau, 267–278. Cambridge: Cambridge University Press, 2009.

Trousson, Raymond. *Le thème de Prométhée dans la littérature européenne*. Geneva: Librairie Droz, 1964.

Vidal, Fernando. *Les sciences de l'âme XVI<sup>e</sup>–XVIII<sup>e</sup> siècle*. Paris: Honoré Champion, 2006.

Vigier, Jean. "Les idées de temps, de durée et d'éternité dans Descartes." *Revue philosophique de la France et de l'étranger* 89 (1920): 196–233.

Von Leyden, Wolfgang. *Seventeenth-Century Metaphysics: An Examination of Some Main Concepts and Theories*. London: Duckworth, 1968.

Wahl, Jean. *Du rôle de l'instant dans la philosophie de Descartes*. Paris: Alcan, 1920.

Williams, A. *The Common Expositor: An Account of the Commentaries on Genesis 1527–1633*. Chapel Hill: University of North Carolina Press, 1948.

Wippel, John F. "The Condemnations of 1270 and 1277 at Paris." *The Journal of Medieval and Renaissance Studies* 7:2 (1977): 169–201.

Wolfson, Harry A. "The Internal Senses in Latin, Arabic and Hebrew Philosophic Texts." *Harvard Theological Review* 28 (1935): 69–133.

Wollgast, Siegfried. *Philosophie in Deutschland zwischen Reformation und Aufklärung 1550–1650*. Berlin: Akademie-Verlag, 1988.

Wood, Anthony A. *Athenae Oxonienses*, 4 vols. Hildesheim: Georg Olms Verlagsbuchhandlung, 1969.

Wundt, Max. *Die deutsche Schulmetaphysik des 17. Jahrhunderts*. Tübingen: Verlag von J.C.B. Mohr, 1939.

Zarka, Yves-Charles. *La décision métaphysique de Hobbes: conditions de la politique*. Paris: Vrin, 1987.

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